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1961

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JOURNAL OF THE
MARINE BIOLOGICAL ASSOCIATION
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3062
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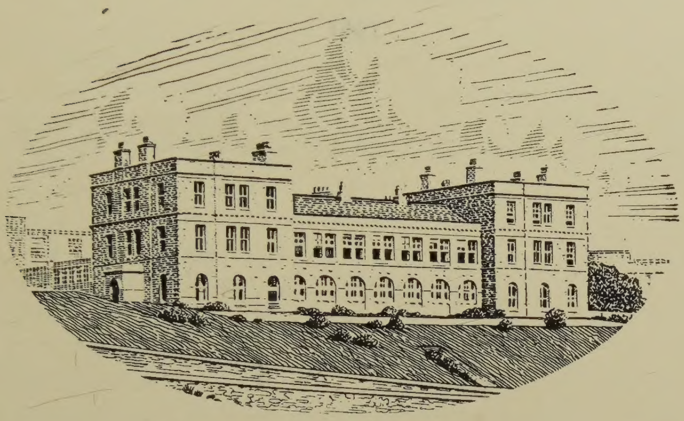

THE PLYMOUTH LABORATORY

VOLUME 40 - Special Edition
1961

CAMBRIDGE
AT THE UNIVERSITY PRESS
1961

PUBLISHED BY

THE SYNDICS OF THE CAMBRIDGE UNIVERSITY PRESS

Bentley House, 200 Euston Road, London, N.W.1
American Branch: 32 East 57th Street, New York 22, N.Y.

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CAMBRIDGE UNIVERSITY PRESS
1961

Printed by Latimer, Trend & Co. Ltd., Plymouth

SYNOPSIS OF THE MEDUSAE OF THE WORLD

EDITOR'S NOTE

Dr P. L. Kramp's ' Synopsis of the Medusae of the World ' is being published as a special volume of the Journal of the Marine Biological Association. *As Volume* 40 *it will be additional to the normal annual volumes, of which the usual three parts will be published in* 1961 *to form Volume* 41.

The Synopsis is appearing in this Journal by agreement with Dr Kramp, to ensure that it is available to as many marine biologists as possible.

Acknowledgements are due to the Council of the Royal Society for making a generous grant from the Scientific Publications Fund to cover the cost. It will be noted that the Council of the Royal Society also gave Dr Kramp a grant from the Browne Research Fund to enable him to employ an assistant. It is thus fitting that the Synopsis should appear in this Journal, because the late E. T. Browne was not only a great benefactor to the Marine Biological Association but also a leading authority on medusae.

F. S. RUSSELL

SYNOPSIS OF THE MEDUSAE OF THE WORLD

By P. L. KRAMP
Zoological Museum, Copenhagen

PREFACE

This work was started many years ago in the form of a card-index for my own use. At the beginning the building up of the index involved a great deal of work, but later on it saved me time for my studies, and it was not difficult to keep it up to date. One day my friends, Dr F. S. Russell, director of the Marine Biological Laboratory, Plymouth, and Dr W. J. Rees, British Museum (Nat. Hist.), London, saw this index, and they repeatedly urged me to put it into a form suitable for publication for the benefit of other students of medusae. I agreed, though hesitatingly, because my time was much occupied. A grant from the Browne Research Fund of the Royal Society of London, however, enabled me to employ an assistant, Mr J. Lützen, who under my supervision could carry out the necessary revision and the typing, as well as some translation from Danish or other languages into English; he has done it remarkably well, and I wish to thank him for his industrious and painstaking collaboration.

Since new information is continually added to our knowledge, a work like this can never be finished, but one must draw a line, and the time has now come to publish. In the future supplements could be prepared at any time from my card-index which, as before, will continually be kept up to date.

During a stay in Plymouth in the summer of 1958 I had the great pleasure of discussing several points with Dr Russell, who willingly looked through the manuscript; his critical remarks and practical suggestions have led to important improvements for which I owe him my most sincere and hearty thanks. The responsibility for the bibliography is entirely my own, but as far as the diagnoses are concerned his suggestions were of the utmost value to ensure as clear and concise a manner of expression as possible.

This is not a general natural history of the medusae; in this respect reference should be made to the various textbooks, especially to Libbie Hyman: *The Invertebrates, Protozoa through Ctenophora*, 1940, and to the Introduction to F. S. Russell: *The Medusae of the British Isles*, 1953. No explanations of terms and anatomical structures are given, and no discussions on taxonomy. The bibliography in itself is the most important constituent of the work, but the diagnoses of all known species and their genera and families should be helpful for zoologists who, I am glad to see, in increasing number have taken up these interesting and fascinating animals for special studies.

I have mainly followed the usual and well established nomenclature of the medusae. We may hope some time in the future to be able to establish a single classification of hydroids and medusae, but the attempts of some recent authors to approach a satisfactory solution of this problem do not seem to me to simplify the matter, but rather to add to the confusion. Some advance has been made towards a natural classification of the families on a scientific basis; the nomenclature, on the other hand, is a technical undertaking and is meant to serve practical purposes such as identification of genera and species; for the time being the previously adopted classification and nomenclature of the medusae seem to me the most appropriate for this purpose.

The list comprises about 900 species, belonging to 272 genera and 68 families of the twelve orders: Anthomedusae, Leptomedusae, Limnomedusae, Trachymedusae, Narcomedusae, Actinulida, Pteromedusae, Stauromedusae, Cubomedusae, Coronatae, Semaeostomeae and Rhizostomeae. The orders and families are mentioned in systematic succession, but within each family the genera are given in alphabetical order, and within each genus the species are likewise arranged alphabetically. Doubtful species are included in alphabetical order among the well described species, but it is stated that they are doubtful or unrecognizable. The references to the literature indicate if a species has been observed only once and by whom.

A complete systematic revision is not intended except in those groups which I have myself studied so thoroughly that I have reached conclusions which, in my own opinion, are indubitable.

I have followed the principle that it is better to retain too many species than to unite species whose identity cannot be stated with certainty, thereby causing confusion in zoogeographical discussions.

As far as the Anthomedusae and Leptomedusae are concerned M. Bedot (*Matériaux pour servir à l'histoire des Hydroides*, Genève 1901–25) gave a very complete bibliography of each species up to 1910, including references to pages and figures, but without geographical records. His work has been of the utmost importance and help, and in my card-index I proceeded in the same way, from 1910 onwards; but I also included geographical records and various other supplementary remarks. In his well known work *Medusae of the World*, Vols. I–III, 1910, A. G. Mayer, provided us with a monograph which proved indispensable for all students of the group, comprising all the orders of medusae, with complete descriptions and numerous figures as well as the bibliography of each species. The geographical distribution of each species was also given, but usually in summarized form without the names of the authors and dates of publication of the geographical records. To go back to the time before 1910 and provide Bedot's and Mayer's references with supplementary records would be almost impracticable and, so it seems to me, unnecessary. The present work, therefore, continues from the year 1910, including a few previous records which were not yet available to Mayer while his book was written. Especially the important work on the medusae of the eastern tropical Pacific by H. B. Bigelow (1909) could not be quoted by Mayer until the first parts of his book had been completed.

The records which I have found it desirable to give in the present work are as follows:

Diagnoses. Full descriptions of genera and species would make this work a monograph, which it would be too optimistic to begin at my age and would also increase the expense of printing tremendously. They contain, therefore, only the necessary distinctive characters, and those characters which occur throughout a genus are not repeated in the diagnoses of its species; likewise family characters are not repeated for the genera. In quotations of descriptions of more or less doubtful species particularly surprising, and perhaps erroneous, statements are marked by an (!). Colours are mentioned only where they are especially conspicuous. Hydroids, where known, are usually only briefly mentioned under the families.

It should be emphasized that for a reliable identification of the species it is necessary to consult the detailed descriptions in the literature. The sizes of the species as given in the diagnoses apply to adult specimens; unfortunately it has been necessary to omit descriptions of developmental stages.

Records. For each species is given the first record in the literature followed by a complete list of papers in which it has been mentioned since 1910. Within each separate year of publication the papers are arranged alphabetically according to the names of the authors. Each record comprises: author's name, year of publication, pages, figures if present, and new records of occurrence. Previous records of occurrence are given in brackets, if they are derived from papers older than 1910; thus, as a rule it seems desirable to quote the statements of distribution as given by Mayer, 1910, pointing out, if possible, his own new records. As a rule the geographical distribution is given only in abbreviated form, not in detail.

The name, under which the species is mentioned by the author, is given only when it differs from that in the heading of the species. The headings denote the names regarded by myself as correct, whereas other opinions are quoted in the lists. Occasionally, when considered advisable, other remarks of the contents of a paper are added. I have seen the vast majority of the literature myself, though some papers have been inaccessible to me and are included as second-hand quotations. Popular articles and handbooks are included only if containing original statements, not if mere compilations.

Bibliography. A list of the papers in full titles is given alphabetically according to the names of the authors. Papers issued before 1910 are included in the list only if they contain original descriptions. In the last pages is given a list of synonyms with references to the genera and species to which they should be referred.

Acknowledgements. My grateful thanks are due to Mr Ernest White and Miss Sarah Dawkins of the British Museum for much careful work in the arrangement of the list of references and transcription of the abbreviations in order to bring them into accordance with the official World List. I also wish to thank Mr G. M. Spooner, Plymouth, for checking the nomenclature; quite a number of specific names have throughout long spans of years remained with erroneous endings owing to misunderstanding of the gender of the generic names; all such errors are here corrected. Mr K. W. Petersen, Copenhagen, has rendered valuable assistance in revision of the references while in press. My most cordial thanks are due to Dr F. S. Russell and Dr W. J. Rees for much valuable information and for help in reading the proofs.

P. L. Kramp

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Order ANTHOMEDUSAE

Hydromedusae with considerable variation in form, with umbrella usually deep bell-shaped; with gonads almost invariably situated on stomach, very rarely extending perradially on subumbrella; with or without ocelli; without statocysts. Hydroids always athecate.

Family *CORYNIDAE*

Anthomedusae with a simple circular mouth; with four radial canals, with gonads completely surrounding the manubrium; with 2–4 hollow marginal tentacles; with ocelli on the abaxial side of the tentacle bulbs. Hydroids *Coryne*-like.

Genus ***Dicodonium*** Haeckel 1879

Corynidae with two well developed and two rudimentary tentacles. No meridional lines of nematocysts on exumbrella. Abaxial ocelli sometimes present. Hydroids unknown.

Type-species: *D. cornutum* Haeckel.

HAECKEL 1879, p. 27: *Dicodonium*. VANHÖFFEN 1891, p. 443: *Dicodonium* referred to *Corymorphidae*. MAYER 1910, p. 44: *Dicodonium*, inclusive *Dinema* Haeckel and *Sarsiella* Hartlaub. HARTLAUB 1917, p. 393: retains the name *Sarsiella* for *S. dinema* Hartlaub = *Dinema slabberi* Haeckel.

Dicodonium adriaticum Graeffe 1884

4 mm high, 3·5 mm wide, with a small, conical apical projection, no apical canal. Manubrium short, thick; mouth simple, with four lips(!). Two long perradial tentacles and two perradial rudimentary bulbs; four ocelli present, bordered by stiff sensory hairs. Four small interradial bulbs without ocelli(!). Systematic position doubtful.

GRAEFFE 1884, p. 351: *Dicodonium adriaticum* n.sp.; Adriatic Sea. MAYER 1910, p. 47. NEPPI & STIASNY 1913*b*, p. 31, Pl. 1, fig. 1: Adriatic Sea. KRAMP 1959*a*, pp. 84, 223, fig. 28: diagnosis; distribution.

Dicodonium cornutum Haeckel 1879

4 mm high and wide. Bulging sides and pointed apex. Manubrium spindle-shaped, shorter than bell cavity. Axial canal well developed. Gonad swollen, around middle 1/3 of manubrium. Two large tentacles curled upwards with adaxial clusters of nematocysts; no rudimentary bulbs; no ocelli.

HAECKEL 1879, p. 27, Pl. 1, fig. 6: *Dicodonium cornutum* n.g., n.sp.; Red Sea. MAYER 1910, p. 46, fig. 12.

Dicodonium dissonema Haeckel 1879

Size unknown. Bell-shaped to egg-shaped with blunt conical apex; apical canal present. Manubrium spindle-shaped, wide in middle; large, swollen gonad. Two long tentacles with very large bulbs with abaxial ocelli; rudiments?

HAECKEL 1879, p. 27: *Dicodonium dissonema* n.sp.; Australia. MAYER 1910, p. 45.

Dicodonium floridanum Mayer 1910

4 mm high, 3 mm wide; cylindrical with dome-like apex. Manubrium flask-shaped, as long as bell cavity; no apical canal; gonad around manubrium. Two tentacles with a knob-like swelling near tip; extreme tip thin; no ocelli. Rudiments small, tapering, occasionally developing into tentacles.

MAYER 1910, p. 46, Pl. 2, fig. 5: *Dicodonium floridana* n.sp.; Florida. KRAMP 1959*a*, pp. 83, 231, fig. 26: diagnosis; distribution.

Dicodonium jeffersoni (Mayer 1900)

0·75 mm high, 0·5 mm wide, dome-like; small axial canal. Manubrium tubular, as long as bell cavity; gonads encircling entire manubrium. Two tentacles and two rudiments with ocelli.

MAYER 1900*b*, p. 30, Pl. 37, fig. 126: as *Dinema jeffersoni* n.sp.; Tortugas, Florida. HARTLAUB 1907, p. 67: probably belongs to *Sarsiella*. MAYER 1910, p. 46, Pl. 2, fig. 4, Pl. 3, fig. 1: *Dicodonium jeffersoni*. VANHÖFFEN 1913*a*, p. 415: as *Sarsiella jeffersoni*; West Indies. KRAMP 1959*a*, pp. 83, 232, fig. 25: diagnosis, distribution.

Dicodonium ocellatum (Busch 1851)

5 mm high, 4–5 mm wide; exumbrella with tufts of nematocysts; no apical canal. Manubrium club-shaped, long; gonad encircling manubrium, thickest near mouth. Two tentacles with fairly large bulbs with ocelli; rudiments mere bulbs. Doubtful species.

BUSCH 1851, p. 16, Pl. 2, figs. 1–3: as *Sarsia ocellata* n.sp.; Trieste. HARTLAUB 1907, p. 67, fig. 63: ? synonym with *Sarsiella dinema* (Hckl.). MAYER 1910, p. 46: '*Dicodonium ocellatum*', an abnormal *Sarsia*? KRAMP 1959*a*, p. 83: diagnosis.

Dicodonium punctatum Vanhöffen 1911

1 mm high, bell-shaped; exumbrella sprinkled with pigment granules (? zooxanthellae). Manubrium very short and broad. Two short opposite tentacles, each with a large spherical, terminal swelling; rudiments small, pointed.

VANHÖFFEN 1911*a*, p. 196, fig. 1: *Dicodonium punctatum* n.sp.; north coast of S. America. KRAMP 1959*a*, pp. 84, 232, 233, fig. 27: diagnosis; distribution.

Genus **Dipurena** McCrady 1857

Corynidae with gonad divided into two or more distinct rings surrounding stomach. Hydroids *Dipurena*, *Coryne*-like with all tentacles capitate, or with capitate and reduced filiform tentacles.

Type-species: *D. strangulata* McCrady 1857.

Forbes 1846, p. 286: as *Slabberia* n.g. McCrady 1857, p. 135: *Dipurena* n.g. Mayer 1910, p. 73: as *Slabberia*; p. 719: as *Dipurena*, *Slabberia* being preoccupied. Russell 1953, p. 71: new definition of *Dipurena*.

Dipurena brownei (Bigelow 1909)

Diameter up to 5 mm. No apical projection, jelly rather thick. Gonads 1–5 distinct rings. Four long tentacles, smooth near their bases, the rest with oval, transversely placed nematocyst clusters, irregularly arranged; globular bulbs with ocellus. Possibly = *D. ophiogaster*.

Browne 1905*b*, p. 133, Pl. 2, figs. 1, 2: *Dipurena* sp.; Ceylon. Bigelow 1909*a*, p. 183, Pl. 7, fig. 7, Pl. 44, figs. 8–10: as *Purena brownei*; Mexico, Pacific. Mayer 1910, p. 489: *Slabberia brownei* = *Dipurena* sp. Browne 1905? Foerster 1923, p. 238. Uchida 1927*a*, p. 187: synonym of *D. ophiogaster* Hckl. (= *Purena strangulata* Hartl. 1907). Russell 1953, p. 71: *D. brownei*, ? = *D. ophiogaster*. Kramp 1959*a*, p. 82: = *D. ophiogaster*.

Dipurena dolichogaster Haeckel 1864

Similar to *D. ophiogaster*, but tentacles with numerous rings of nematocysts. Doubtful species.

Haeckel 1864, p. 337: *Dipurena dolichogaster* n.sp.; Mediterranean. Haeckel 1879, p. 25, Pl. 2, figs. 1–7. Mayer 1910, p. 77: *D. dolichogaster* Haeckel – *Slabberia catenata*. Hartlaub 1917, p. 392: doubtful if *D. dolichogaster* Spagnolini & Chun = *S. catenata*. Russell 1953, p. 75: Haeckel's figure of *D. dolichogaster* may be incorrect.

Dipurena halterata (Forbes 1846)

8 mm high, 6 mm wide, bell-shaped. Manubrium very long; gonads with two or more segments surrounding manubrium, leaving upper half free. Distinct, globular apical chamber. Radial canals with a small swelling. Tentacle bulbs with large abaxial ocellus; tentacles with large terminal knobs and 3–6 rings immediately above.

Forbes 1846, p. 286: as *Slabberia halterata* n.sp.; South England. Forbes & Goodsir 1853, p. 311, Pl. 10, figs. 3*a*–*e*: as *S. catenata*; Scotland. Mayer 1900*b*, p. 29, Pl. 18, figs. 75, 76: as *Dipurena picta* n.sp.; Florida. Mayer 1910, p. 75: as *S. halterata*, = *Dipurena halterata* Haeckel (South England; Ireland); p. 77, Pl. 8, figs. 8, 9: as *S. catenata*; Florida. Hadži 1911*c*, p. 188, text-figs. 31–33: as *Dipurena*; Adriatic Sea. Vanhöffen 1911*a*, p. 196: Great Fish Bay, W. Africa. Neppi & Stiasny 1912, p. 557: as *S. halterata*; Trieste. Neppi 1912, p. 716, Pl. 1, figs. 1–3 as *S. halterata*; description; budding individuals; Dalmatia, Adriatic Sea. Neppi & Stiasny 1913*b*, p. 35, Pl. 1, fig. 5: as *S. halterata*; Trieste. Vanhöffen 1913*a*, p. 415:

as *D. catenata*; Florida. HADŽI 1914, p. 288: as *S. halterata*; budding. INTERN. PLANKT. CATAL. III 1916, p. 42: Ireland. HARTLAUB 1917, p. 392: as *S. halterata*; remarks to Vanhöffen, Neppi, Neppi & Stiasny; doubtful that *D. dolichogaster* Haeckel = *S. catenata*. LEBOUR 1917, p. 161: as *S. halterata*; Plymouth. PELL 1918, pp. 22–24, fig. 1: as *S. halterata*; Adriatic Sea. FOERSTER 1923, p. 238: as *S. catenata*; Victoria harbour, Pacific coast of N. America. PEACOCK 1923, p. 94: Cullercoats, England. RUSSELL 1927, p. 569: as *S. halterata*; Plymouth. KRAMP 1930, p. 10: as *S. halterata*; Dover Strait, Channel. SANDERSON 1930, p. 223: Northumberland coast. MAR. BIOL. ASS. 1931, p. 79: (Plymouth). RUSSELL 1931*b*, tab. I: as *S. halterata*; Plymouth. RUSSELL 1933, tab. 1.: Plymouth. MOORE 1937, p. 48: Port Erin, Isle of Man. PELL 1938, p. 922: as *S. halterata*; Adriatic Sea. RUSSELL 1938*b*, pp. 413, 416, 417: Plymouth. REES 1939*a*, pp. 343–346, figs. 1–3: description of the hydroid; Plymouth. BABNIK 1948, p. 14: as *S. halterata*; Adriatic Sea. BERRILL 1950, p. 306, fig. 7*e–g*: as *S. halterata*; budding. FRANC 1951, p. 27: French coast of Channel. RUSSELL 1953, pp. 67–68, Pl. 1, fig. 3, Pl. 2, fig. 2, text-figs. 28, 29*a–c*: *D. catenata* synonym of *D. halterata*; British coasts. SOUTHWARD 1954, p. 18: Irish Sea. KRAMP 1959*a*, pp. 82, 215, 216, 217, 218, 223, 227, 231, 233, fig. 21: diagnosis; distribution.

Dipurena ophiogaster Haeckel 1879

Medusa: 5 mm high, higher than wide, jelly thick. Manubrium, when extended, very long; gonad with 2–6 or more segments surrounding manubrium. Apical chamber distinct. Tentacles with irregularly distributed clusters of nematocysts.

ALLMAN 1871, p. 46, text-fig. 17: as *Sarsia strangulata*; Ireland. SPAGNOLINI 1876, p. 18, Pl. 2, fig. 3: as *Sarsia dolichogaster*; Naples. HAECKEL 1879, p. 25: *Dipurena ophiogaster*; British coasts. CHUN 1896, p. 6, Pl. 1, figs. 1–4: as *D. dolichogaster*; Mediterranean. MAYER 1910, p. 79, figs. 36, 37: as *Slabberia ophiogaster* (Hckl.); possibly = *D. ophiogaster* (?) Browne 1905*b* from Ceylon; (England; Ireland; Naples; ? Ceylon). HARTLAUB 1917, p. 391: as *Purena strangulata* (Allm.). UCHIDA 1927*a*, p. 187, fig. 27: *D. ophiogaster* = *Purena strangulata* Hartl. 1907, *Purena brownei* Big. 1909, *Slabberia brownei* Mayer 1910; Misaki, Japan. MAR. BIOL. ASS. 1931, p. 79: as *Purena* (*Sarsia*) *strangulata*; Plymouth. RUSSELL 1938*b*, pp. 413, 416, 417: Plymouth. REES 1941*a*, p. 131, fig. 2: Valencia harbour, Ireland. KRAMP 1947, p. 50: as *Purena strangulata*; Skagerak. UCHIDA 1947*a*, p. 299, fig. 2: Palao Islands, Pacific Ocean. RUSSELL 1953, p. 71, Pl. 1, fig. 5, Pl. 2, fig. 4, text-figs. 25E, 30A, B, 31: British coasts. YAMAZI 1958, p. 135: Tanabe Bay, Japan. KRAMP 1959*a*, pp. 82, 215, 216, 218, 223, 271, fig. 22: diagnosis; distribution.

Dipurena pyramis (Haeckel 1879)

5 mm high, 5 mm wide; pyramidal. Exumbrella with four perradial lines of nematocysts. Gonads eight separated rings. Edges of radial canals lined with gland-cells. Tentacles terminate in ‘ suctorial cups ’. Ocelli present? Systematic position doubtful.

HAECKEL 1879, p. 26: as *Bathycodon pyramis* n.sp.; Corfu, Mediterranean. MAYER 1910, p. 79: as *Slabberia pyramis*. KRAMP 1959*a*, p. 82: doubtful species.

Dipurena reesi Vannucci 1956

Medusa similar to *D. ophiogaster*, but hydroid with a single oral whorl of capitate tentacles in addition to basal whorl of filiform tentacles.

VANNUCCI 1956*a*, pp. 479–487, text-figs. 1, 2, Pls. 1, 2: *Dipurena reesi* n.sp.; hydroid, newly reared and adult medusae; Saõ Paulo, Brazil. KRAMP 1959*a*, pp. 82, 232, 233: diagnosis; distribution.

Dipurena strangulata McCrady 1857

2–4 mm high, 3·3–4 mm wide. Ellipsoidal to hemispherical. Manubrium long; gonads a small ring near middle and a longer ring distally. Distinct apical chamber. Tentacle bulbs large, with abaxial ocellus; tentacles stiff, with one, terminal knob of nematocysts.

MCCRADY 1857, p. 135, Pl. 9, figs. 1, 2: *Dipurena strangulata* n.g., n.sp.; South Carolina. MAYER 1910, p. 76, Pl. 7, figs. 1–3: as *Slabberia strangulata*; New England; p. 77, Pl. 7, fig. 4: as *S. strangulata* var. *fragilis*; Florida. BIGELOW 1914*b*, p. 4: as *S. strangulata*. FISH 1926, p. 123: Woods Hole. KRAMP 1955*a*, p. 273, fig. 2: Gulf of Guinea. KRAMP 1959*a*, pp. 81, 211, 227, 231, fig. 20: diagnosis; distribution.

Genus ***Hydrocoryne*** Stechow 1907

Young medusa similar to *Sarsia*, exumbrella sprinkled with conspicuous nematocyst clusters. Hydroid: *Hydrocoryne* Stechow 1907.

Type-species: *H. miurensis* Stechow.

STECHOW 1907, p. 35: *Hydrocoryne* n.g. Hydroid. UCHIDA 1932, p. 135: young medusa.

Hydrocoryne miurensis Stechow 1907

1–1·5 mm high, 0·8–1·2 mm wide. Cubic, thin but rigid. Manubrium flask-shaped, half as long as bell cavity, mouth round. Four radial canals, broad. Tentacles long, with clusters of nematocysts; basal bulbs large, with ocellus. Young medusa.

Hydroid: *H. miurensis*.

STECHOW 1907, p. 35, Pl. 3, figs. 1–3, Pl. 5, figs. 1–4, Pl. 7, figs. 10–11: *Hydrocoryne miurensis* n.g., n.sp.; description of the hydroid; Japan. UCHIDA 1932, p. 135, fig. 1: description of the young medusa; Japan. UCHIDA 1938*b*, p. 37: distribution in Japan of the hydroid and the medusa. UCHIDA 1938*c*, p. 48: Ishihama, Japan. UCHIDA 1940*a*, p. 283: Japan (only the hydroid).

Genus ***Linvillea*** Mayer 1910

Manubrium cruciform in cross-section; four tentacles, terminate each in a knob-like cluster of nematocysts; bulbs large, with abaxial ocellus; eight irregular, longitudinal rows of nematocysts on exumbrella.

Type-species: *L. agassizi* (McCrady 1857).

McCrady 1857, p. 131: as *Corynitis* n.g. Mayer 1910, p. 71: as *Corynitis*; p. 719: *Corynitis* preoccupied, new name *Linvillea* is proposed. Hargitt 1912, pp. 815–818: *Corynitis*, discussion.

Linvillea agassizi (McCrady 1857)

2·5 mm high. Exumbrella with four long perradial rows of nematocysts and four shorter interradial. Large conical apical projection with large apical chamber. Manubrium very large and swollen, mouth without lips; gonad swollen, with four deep, interradial furrows. Four straight, stiff tentacles, rather short, each with a large, terminal knob; bulbs large, with abaxial ocellus.

McCrady 1857, p. 132, Pl. 9, figs. 3–8: as *Corynitis agassizii* n.sp.; Atlantic coast of N. America. Mayer 1910, p. 72, Pl. 5, fig. 2, fig. 35: as *Corynitis agassizii*; p. 719: *Linvillea agassizii* n. nom. Bigelow 1914*b*, p. 5: as *C. agassizii*. Hartlaub 1917, p. 390. Kramp 1959*a*, pp. 82, 211, 231, fig. 13: diagnosis; distribution.

Linvillea arcuata (Haeckel 1879)

Differs from *L. agassizi* by its long, narrow bell and by its long, thin tentacles; the stomach is small and bell-shaped. Doubtful species.

Haeckel 1879, p. 49: *Corynetes arcuata* n.sp.; Brazil. Mayer 1910, p. 73: *Corynitis arcuata*. Hartlaub 1913, p. 242: *Corynetes arcuata*. Vannucci 1951*b*, p. 106: *Corynitis arcuata* (Brazil sec. Mayer).

Genus ***Sarsia*** Lesson 1843

Corynidae with four similar, perradial tentacles. With gonads forming a single continuous ring or cylinder surrounding stomach. Exumbrella without rows of nematocysts.

Hydroid: *Coryne*, with all tentacles capitate.

Type-species: *S. tubulosa* (Sars).

Lesson 1843, p. 333: *Sarsia* n.g. Mayer 1910, p. 47: *Sarsia* = *Codonium* Hckl., *Syndictyon* A. Agass. and Hckl. Bigelow 1913, p. 3. Hartlaub 1917, p. 381. Uchida 1927*a*, p. 178: generic diagnosis.

Sarsia angulata (Mayer 1900)

3 mm high, half-egg-shaped, moderately thick walls. Manubrium spindle-shaped, without apical chamber, 2/3 as long as bell cavity, gonad from base almost to the mouth. Slender tentacles with fairly thick, spindle-shaped ends.

Mayer 1900*a*, p. 5, figs. 6–8, Pl. 3: as *Syndictyon angulatum* n.sp.; Bahamas. Mayer 1910, p. 60, Pl. 5, fig. 1, Pl. 6, fig. 3: *Sarsia angulata*; Tortugas, Florida. Hartlaub 1917, p. 388. Kramp 1959*a*, pp. 80, 231, fig. 17: diagnosis; distribution.

Sarsia barentsi Linko 1905

3–4 mm high, 3 mm wide; conical. Manubrium shorter than bell cavity, always S-shaped. Tentacle bulbs heart-shaped. Doubtful species.

LINKO 1905, p. 214: *Sarsia barentsii* n.sp.; Barents Sea. MAYER 1910, p. 53: as synonym to *S. tubulosa* var. *mirabilis*. HARTLAUB 1917, pp. 381, 382, 384. THIEL 1932*a*, p. 126. THIEL 1932*b*, p. 438 ff.: distribution. KRAMP 1959*a*, pp. 80, 207, 208, 209: diagnosis; distribution.

Sarsia brachygaster Grönberg 1898

15–18 mm high, 8–10 mm wide. Manubrium 2/3 as long as bell cavity, cylindrical, without apical chamber, completely encircled by gonad. Tentacle bulbs of medium size, ocelli very small. Doubtful species.

GRÖNBERG 1898, p. 459, Pl. 27, figs. 3, 4: *Sarsia brachygaster* n.sp.; Spitzbergen; Jakobshavn, W. Greenland. MAYER 1910, p. 59. KRAMP 1914, p. 405: distribution. KRAMP 1926*a*, p. 20: as *S. brachygaster* in part. Grönberg's specimen from W. Greenland = *Euphysa flammea*. THIEL 1932*a*, p. 126: *S. brachygaster* is retained, with exception of the specimen from W. Greenland. THIEL 1932*b*, pp. 438 ff.: distribution. KRAMP 1959*a*, pp. 80, 207, 208, 209, fig. 18: diagnosis; distribution.

Sarsia brevia Uchida 1947*

0·7 mm high, 0·8 mm wide; thick. Manubrium as long as bell cavity, bulged voluminous; small, round mouth. Four tentacles with conspicuous bulbs with abaxial ocelli; tentacles short, with four abaxial clusters of nematocysts.

UCHIDA 1947*a*, p. 299, fig. 1: *Sarsia brevia* n.sp.; Palao Islands, Pacific. KRAMP 1955*a*, p. 246: should probably be transferred to Tubulariidae.

Sarsia clavata Keferstein 1862

Doubtful species.

KEFERSTEIN 1862, p. 27, Pl. 2, figs. 1, 2: *S. clavata* n.sp.; French coast of the Channel. HARTLAUB 1907, p. 51, fig. 46. MAYER 1910, p. 77: ? = *Slabberia catenata*. NEPPI & STIASNY 1913*b*, p. 32: = *S. gemmifera*. HARTLAUB 1917, p. 388: agrees with Neppi & Stiasny. RUSSELL 1953, p. 61: = *S. gemmifera*.

Sarsia coccometra Bigelow 1909

5 mm high, 4 mm wide; thin walls, pointed apex; short apical canal. Manubrium as long as bell cavity, entirely encircled by gonad; eggs very large. Tentacles ringed with prominent nematocyst swellings, distal end swollen, knob-like; bulbs swollen, with ocelli.

BIGELOW 1909*a*, p. 179, Pl. 7, fig. 8, Pl. 40, fig. 1, Pl. 43, figs. 8–9: *Sarsia coccometra* n.sp.; Pacific coast of Central America. MAYER 1910, p. 488. FOERSTER 1923, p. 235.

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* See Addenda, p. 444.

Sarsia conica (Haeckel 1880)

12 mm high, 4 mm wide, barrel-shaped with large, conical apex. Manubrium half as long as bell cavity; stomach subspherical, swollen by encircling gonad; short cylindrical throat-tube free of gonads. Long axial canal. Four tentacles with small oval bulbs.

HAECKEL 1880, p. 634: as *Codonium conicum* n.sp.; Indian Ocean. MAYER 1910, p. 58: *Sarsia conica.*

Sarsia eximia (Allman 1859)

3–4 mm high, 2 mm wide, oval, moderately thick walls. Manubrium cylindrical, entirely surrounded by gonad, about as long as bell cavity; no apical chamber. Tentacles with large, oval bulbs, round nematocyst warts and distinct terminal-knob.

ALLMAN 1859, p. 141: as *Coryne eximia* n.sp. BÖHM 1878, p. 191, Pl. 6, figs. 7–26, Pl. 7, figs. 1–6: *Sarsia eximia.* MAYER 1910, p. 57, figs. 19–21: (N.W. Europe; Alaska). HADŽI 1911*b*, p. 475: as *Syncoryne eximia*; nematocysts. HADŽI 1911*c*, p. 187: as *Syncoryne*; Adriatic Sea. BIGELOW 1913, p. 4: Dutch Harbour; Petropaulski. VANHÖFFEN 1913*b*, p. 4, Pl. 1, fig. 1, Pl. 2, fig. 1, text-fig. 1: Valparaiso. INT. PLANKT CATAL. III. 1916, p.43: England. HARTLAUB 1917, p. 381: distribution, supplement. LEBOUR 1917, p. 161: Plymouth. DICK 1919, p. 91: Firth of Clyde. FOERSTER 1923, p. 235: (North American Pacific coast). COY 1924, p. 55: Cullercoats, Northumberland, England. SANDERSON 1930, p. 231: Northumberland coast. WATSON 1930, p. 233: Northumberland coast. MAR. BIOL. ASS. 1931, p. 79: Plymouth. THIEL 1932*a*, p. 125: partly erroneous. THIEL 1932*b*, pp. 438 ff.: distribution; partly erroneous. RUSSELL 1938*b*, pp. 413, 416, 417: Plymouth. RUSSELL 1938*d*, p. 150, figs. 8–12: nematocysts. BERRILL 1950, p. 306, fig. 7D: (the hydroid, budding). FRANC 1951, p. 27: Dinard-Saint-Malo, French Channel coast. RUSSELL 1953, p. 50, Pl. 2, fig. 3, figs. 17A, 18A, B: British coasts. SOUTHWARD 1954, p. 17: Irish Sea. VANNUCCI 1956*b* pp. 244, 249: Clyde Sea, Scotland. VANNUCCI 1957*d*, pp. 39, 84, 97, 98, 99, 102: Brazil; comparison with *Stauridiosarsia producta.* KRAMP 1958*a*, p. 115: Villefranche, Mediterranean Sea. KRAMP 1959*a*, pp. 79, 215, 220, 223, 271, fig. 15: diagnosis; distribution. WERNER 1959*a*, p. 33: Port Erin, Isle of Man.

Sarsia gemmifera Forbes 1848

Up to 5 mm high, pyriform. Manubrium with short, conical apical chamber, very long and thin, gonad around distal end above the stomach. Medusa buds at intervals along the manubrium. Tentacles with small bulbs, with clasps of nematocysts and a distinct terminal knob.

FORBES 1848, p. 57, Pl. 7, fig. 2: *Sarsia gemmifera* n.sp.; British Isles. MAYER 1910, p. 62, fig. 25: (North-western Europe). LE DANOIS 1913*d*, p. 305, fig. 2: as *Purena gemmifera*; north coast of Spain. NEPPI & STIASNY 1913*b*, p. 9, Pl. I, figs. 2, 3: Adriatic Sea. HADŽI 1914, p. 288: budding. INT. PLANKT. CATAL. III 1916, p. 43: England. HARTLAUB 1917, p. 391: as *Purena gemmifera*; p. 393: *Dipurena fertilis* Metschnikoff 1870 = *P. gemmifera.* PELL 1918, pp. 22, 24: Adriatic Sea. DICK 1919, p. 91: as *Purena gemmifera*; Firth of Clyde. SVERDRUP 1921, p. 14, Pl. 1, fig. 3:

Kristianiafjord, Norway. LEBOUR 1922, p. 661: food. KRAMP & DAMAS 1925, p. 244: Bergen, Norway. MARSHALL 1925, p. 127: as *Purena gemmifera*; Clyde. RANSON 1925*c*, p. 326: Tatihou. KRAMP 1927, p. 35: as *Purena gemmifera*; Denmark. KRAMP 1930, p. 8: S.W. North Sea and eastern part of the Channel. SANDERSON 1930, p. 231: Northumberland coast. MARINE BIOL. ASS. 1931, p. 79: as *Purena gemmifera*; Plymouth. RUNNSTRÖM 1932, p. 27: as *Purena gemmifera*; Herdla- and Hjelte-fjord, Norway. THIEL 1932*a*, p. 127: distribution. KRAMP 1937*b*, p. 27, fig. 8*b*: (Denmark). KÜNNE 1937*b*, p. 6: as *Purena gemmifera*; Baltic Sea. PELL 1938, p. 922: Adriatic Sea. RUSSELL 1938*b*, pp. 413, 416, 418, 420: Plymouth. RUSSELL 1938*d*, p. 150, figs. 13–18: as *Purena gemmifera*; nematocysts. BERRILL 1950, p. 306, figs. 7B–C: budding. KÄNDLER 1950, p. 66: as *Purena gemmifera*; Fehmarnbelt, Baltic Sea. FRANC 1951, p. 27: French Channel coast. KÜNNE 1952, pp. 34, 38: S.E. North Sea. RUSSELL 1953, p. 61, Pl. 1, figs. 1, 4, text-figs. 24, 25A–C: referred to *Sarsia*; British coasts. SOUTHWARD 1954, p. 18: Irish Sea. MAGHRABY & PERKINS 1956, p. 486: Thames estuary. VANNUCCI 1956*b*, p. 249: Clyde Sea, Scotland. VANNUCCI 1957*d*, pp. 37, 39, 84, 97, 98, 99, 102: Brazil. KRAMP 1959*a*, pp. 79, 215, 219, 220, 221, 223, fig. 12: diagnosis; distribution.

Sarsia gracilis Browne 1902

5 mm high, 3 mm wide, cylindrical, walls moderately thick, margin quadrangular. Manubrium 2/3 as long as bell cavity, nearly whole length surrounded by gonad. Tentacles with large, terminal knob.

BROWNE 1902, p. 275: *Sarsia gracilis* n.sp.; Falkland Islands. MAYER 1910, p. 60: the medusa may be a young *Slabberia*? BROWNE & KRAMP 1939, p. 271, Pl. 14, figs. 1, 2, Pl. 15, fig. 1: Falkland Islands. KRAMP 1957*a*, pp. 4, 96, 105, 124: South Africa. KRAMP 1959*a*, pp. 79, 227, 230, 235, 237, 267, fig. 16: diagnosis; distribution.

Sarsia hargitti Mayer 1910

1·5 mm high, 1 mm wide, apex dome-like, very thick. Manubrium may project far beyond velar opening, its terminal end bulb-like, in its proximal part a whorl of sac-shaped gonads. Small, round apical chamber. Tentacles with large bulbs.

HARGITT 1902*b*, p. 550, fig. 3: as *Coryne producta* n.sp.; Woods Hole. MAYER 1910, p. 63, fig. 26: *Sarsia hargitti* n.nom. =*Coryne producta* Hargitt 1902. BIGELOW 1914*b*, p. 3: (Woods Hole). FISH 1926, p. 123: as *Syncoryne producta*; Woods Hole. KRAMP 1959*a*, pp. 78, 211, 213, fig. 11: diagnosis; distribution.

Sarsia inabai Uchida 1933

3–8·5 mm high, 2·5–3·5 mm wide. Umbrella bell-shaped, thick but soft. Manubrium large and flask-shaped, entirely encircled by the gonads, except the apical and distal portions. Tentacle bulbs swollen, each with an abaxial ocellus; tentacles very short, terminating in a large swelling, covered with nematocysts.

UCHIDA 1933*a*, p. 126, fig. 2: *Sarsia inabai* n.sp.; South-west Kamchatka. KRAMP 1942, p. 22: possibly identical with *Plotocnide borealis*.

Sarsia minima von Lendenfeld 1884

3 mm high, 2·5 mm wide; with a spindle-shaped, nearly cylindrical manubrium, one and a half times as long as bell cavity. Tentacles longer than bell height, with rings of nematocysts. Indeterminable species.

von Lendenfeld 1884*a*, pp. 584, 915, Pl. 21, figs. 34, 35: *Sarsia minima* n.sp.; New South Wales, Australia. Mayer 1910, p. 59. Kramp 1953, p. 309: type-specimen examined, indeterminable.

Sarsia nipponica Uchida 1927

1·2 mm high, 0·9 mm wide, nearly spherical; exumbrella with nematocyst clusters. Manubrium spindle-shaped, half as long as bell cavity, encircled by gonads except proximal and distal portions. Tentacle bulbs large, with abaxial ocellus; four stout, hollow tentacles, half as long as bell height, with 6–7 rings of nematocysts and larger terminal knob.

Uchida 1927*a*, p. 183, Pl. 10, fig. 1: *Sarsia nipponica* n.sp.; Kishu, Japan. Uchida 1940*b*, p. 222, fig. 4: Misaki (description of the hydroid, figs. 1–3). Chow & Huang 1958, pp. 174, 189, Pl. 1, fig 1: Chefoo, China. Yamazi 1958, p. 136: Tanabe Bay, Japan.

Sarsia pattersoni Haddon 1886

Doubtful species.

Haddon 1886, p. 525; *S. pattersoni* n.sp.; Ireland. Hartlaub 1907, p. 29. Russell 1953, p. 56: ? =*S. tubulosa.*

Sarsia polyocellata Uchida 1927

2 mm high, 2·2 mm wide; no apical elevation, soft, equally thick throughout. Manubrium short and wide, mouth small; gonads 'separate' on manubrium. Tentacle bulbs triangular, each with five ocelli; tentacles with remarkable nematocyst clusters on the whole length.

Uchida 1927*a*, p. 182, fig. 25: *Sarsia polyocellata* n.sp.; Misaki, Japan.

Sarsia princeps (Haeckel 1879)

Up to 40 mm high, somewhat conical. Manubrium about as long as bell cavity, almost completely covered by gonad; a distinct apical canal, widened in its upper end; radial canals with jagged edges. Tentacles long, with numerous prominent clasps of nematocysts; tentacle bulbs well developed, ocelli small.

Haeckel 1879, p. 13, Pl. 1, figs, 1, 2: as *Codonium princeps* n.sp.; p. 655: *Sarsia princeps*; W. Greenland. Mayer 1910, p. 60, text-fig. 22: *S. princeps*=*Codonium princeps* Haeckel; (Greenland; Spitzbergen). Bigelow 1913, p. 5: Bering Sea. Kramp 1913*a*, p. 264: W. Greenland. Kramp 1914, p. 400: W. Greenland. Hartlaub 1917, p. 383. Bigelow 1920, p. 4, Pl. 1, fig. 1: Alaska. Kramp 1920*a*, p. 5: Newfoundland Bank. Foerster 1923, p. 221: Vancouver, N.W. America. Kramp 1926*a*, p. 2, Pl. 1, figs. 1–4, text-figs. 1–5: Greenland; Spitzbergen;

Barents Sea. UCHIDA 1927*a*, p. 179: Japan. THIEL 1932*a*, p. 126. THIEL 1932*b*, pp. 438 ff.: distribution. KRAMP 1933*b*, p. 15: as *S. tubulosa*; East Greenland. ? UCHIDA 1933*a*, p. 126, fig. 1: S.W. Kamchatka. BERNSTEIN 1934, pp. 8, 24: Kara Sea. RANSON 1936*b*, p. 45: Spitzbergen. FROST 1937, p. 26: Newfoundland. YASHNOV 1939, p. 113: Chukotsky Sea; Kara Sea. DUNBAR 1942, p. 72: eastern arctic Canada. KRAMP 1942, p. 12: W. Greenland. YASHNOV 1948, p. 67, Pl. 18, fig. 1: Barents Sea to Bering Sea and Okhotian Sea. VIBE 1950*a*, p. 103: N.W. Greenland. NAUMOV 1951*a*, p. 62: Barents Sea. NAUMOV 1951*b*, p. 748, fig. 2: rearing of hydroid; north of Russia. CHIU 1954*b*, p. 56. KRAMP 1955*b* p. 150. MACGINITIE 1955, pp. 93, 94, 118: Point Barrow, Alaska. NAUMOV 1956*b*, p. 37. PETERSEN 1957, p. 25: Cape Farewell, Greenland; E. Greenland. KRAMP 1959*a*, pp. 79, 208–11, 269, fig. 13: diagnosis; distribution.

Sarsia prolifera Forbes 1848

Up to 4 mm high and wide, bell-shaped, walls fairly thin, bell-margin four-sided. Manubrium shorter than bell cavity; gonad surrounding almost whole length of manubrium leaving both ends free. The tentacle bulbs, even in young stages, with clusters of medusa buds.

FORBES 1848, p. 59, Pl. 7, fig. 3: *Sarsia prolifera* n.sp; Cornwall, England. MAYER 1910, p. 61, figs. 23, 24: *S. prolifera* = *S. codonophorum* Hckl. Southern England (new record); Mediterranean (if = *codonophorum*). INT. PLANKT. CATAL. III 1916, p. 43: England. HARTLAUB 1917, p. 388. LEBOUR 1917, p. 161: Plymouth. LEBOUR 1922, p. 661: food. LEBOUR 1923, p. 84: food. RANSON 1925*c*, p. 325: Roscoff, Channel. SANDERSON 1930, p. 222: Northumberland coast. MAR. BIOL. ASS. 1931, p. 79: Plymouth. RANSON 1932a, p. 993: Roscoff. THIEL 1935*c*, pp. 165, 172: Black Sea. RUSSELL 1938*b*, pp. 413, 416: Plymouth. BERRILL 1950, p. 306, fig. 7A: budding. RUSSELL 1953, p. 52, Pl. 2, fig. 1, text-figs. 17B, 19, 20, 25D: British coasts. KRAMP 1959*a*, pp. 79, 215, 218, 223, 225, fig. 14: diagnosis; distribution.

Sarsia radiata von Lendenfeld 1884

3 mm high, 2·5 mm wide. Manubrium cylindrical, half as long as bell height; gonad from the inner apex of the bell cavity to near the mouth. Tentacles with large bulbs; ocelli present? Indeterminable species.

VON LENDENFELD 1884*b* pp. 584–591: *Sarsia radiata* n.sp.; New South Wales. MAYER 1910, p. 58. KRAMP 1953, p. 309: Indeterminable. ? GANAPATI & NAGABHUSHANAM 1958, pp. 92, 94: Vizagapatam coast, India.

Sarsia resplendens Bigelow 1909

2·2 mm high, 2 mm wide; no apical projection. Manubrium half as long as bell cavity, wide at base, narrow distally, mouth four-sided; gonad surrounding entire manubrium, except short mouth tube. Tentacles with swollen bulbs with large ocelli, very short, with uniformly distributed nematocysts.

BIGELOW 1909*a*, p. 181, Pl. 7, fig. 1, Pl. 40, fig. 8: *Sarsia resplendens* n.sp.; Acapulco Harbour, Mexico. MAYER 1910, p. 487: *S. resplendens* = *S. eximia?* FOERSTER 1923, p. 238. UCHIDA 1927*a*, p. 184, Pl. 10 fig. 2*a*, *b*: Misaki, Japan.

Sarsia reticulata (A. Agassiz 1862)

4 mm high, 3·5 mm wide; quite thick at apex. Manubrium shorter than bell cavity, with short, conical apical chamber; gonad on greater part of the manubrium. Tentacles not very long, with prominent nematocyst groups. Exumbrella of young specimens with reticulated clusters of nematocysts.

A. AGASSIZ 1862, p. 340: as *Syndictyon reticulatum* n.sp.; New England. HARTLAUB 1907, p. 45, figs. 41–43: *Sarsia reticulata.* MAYER 1910, p. 57, Pl. 4, figs, 3, 4, Pl. 5, fig. 6: as *S. mirabilis* var. *reticulata.* BIGELOW 1914*b*, p. 3: ? variety of *S. mirabilis* (New England).

Sarsia rosaria (L. Agassiz 1862) Hartlaub 1907

15–30 mm high, 10–15 mm wide, fairly thick walls, a small apical projection. Manubrium short, spindle-shaped, about the length of bell cavity; a short apical canal; gonad leaving both ends free. Tentacle bulbs large, flanked by two large nematocyst pads.

L. AGASSIZ 1862, p. 340: as *Coryne rosaria* n.sp.; W. America. HARTLAUB 1907, p. 17, fig. 9: as *Sarsia apicula*; p. 50, fig. 45: *Sarsia rosaria.* KISHINOUYE 1910, p. 24: Kuriles. MAYER 1910, p. 59: *S. rosaria* = *S. apicula* and *rosaria* Hartlaub 1907. HARTLAUB 1917, pp. 383, 388. FOERSTER 1923, pp. 236, 237. UCHIDA 1927*a*, p. 180. THIEL 1932*a*, p. 127. THIEL 1932*b*, pp. 439 ff.: distribution. CHIU 1954*b*, p. 56.

Sarsia siphonophora Haeckel 1879

8 mm high, 6 mm wide. Manubrium four times as long as bell cavity, with numerous medusa buds spirally arranged. Tentacle bulbs large, tentacles long, with alternating nematocyst warts, without a terminal knob; gonads not described.

HAECKEL 1879, p. 20, Pl. 1, fig. 4: *Sarsia siphonophora* n.sp.; Canary Islands. MAYER 1910, p. 62: probably identical with *S. gemmifera.* HARTLAUB 1917, p. 391: probably identical with *S. gemmifera.* KRAMP 1955*a*, p. 307: probably not identical with *S. gemmifera.* KRAMP 1959*a*, p. 79: diagnosis.

Sarsia tubulosa (M. Sars 1835)

Up to 18 mm high, somewhat higher than wide, dome-like, walls moderately thick. Manubrium very long, both ends free of gonads; distinct, globular apical chamber. Tentacles with broad bulbs, very long, densely beset with spangles and groups of nematocysts.

M. SARS 1835, p. 25, Pl. 5, fig. 11: as *Oceania tubulosa* n.sp.; Norway. MAYER 1910, p. 52: *Sarsia tubulosa*; (Northern Europe; Iceland); p. 53, Pl. 3, figs. 2, 4, 5. Pl. 4, figs. 1, 2: *S. tubulosa* var. *mirabilis*; New England; p. 57, Pl. 4, figs. 3, 4, Pl. 5, fig. 6, figs. 13–18: *S. mirabilis* var. *reticulata*; New England. KRAMP 1913*a*, p. 265: as *S. mirabilis*; W. Greenland. KRAMP 1913*b*, p. 524. LE DANOIS 1913*d*, p. 304, fig. 1: *Sarsia* sp.; Thorshavn, Faroes. BIGELOW 1914*b*, p. 3: *S. mirabilis*, probably = *S. tubulosa*; New England. BIGELOW 1914*d*, p. 407: Massachusetts Bay.

KRAMP 1914, p. 402: as *S. mirabilis*; W. Greenland. KRAMP 1915, p. 9: as *S. tubulosa* and *eximia*; Great Belt and Kattegat, Denmark. INT. PLANKT. CATAL. III 1916, p. 43: England; Ireland; Denmark; Sweden. HARTLAUB 1917, p. 383: as *S. densa* and *tubulosa*; p. 384: as *S. mirabilis*; p. 386, fig. 333: as *S. coacta* n.sp.? LEBOUR 1917, p. 161: Plymouth. DICK 1919, p. 91: as *S. densa*; Firth of Clyde. SVERDRUP 1921, p. 14, Pl. 1, fig. 1: Kristianiafjord, Norway; as *S. apicula*? Pl. 1, fig. 2. LEBOUR 1922, p. 656, fig. 3; food. FOERSTER 1923, p. 221: as *S. mirabilis*; Vancouver; p. 236: as *S. rosaria*?; W. America. LEBOUR 1923, p. 84: food. COY 1924, p. 55: Northumberland coast, England. KRAMP & DAMAS 1925, p. 240: Norway. MARSHALL 1925, p. 126: Clyde, Scotland. USSING 1925, p. 73: Mariager fjord, Denmark. BIGELOW 1926, p. 43: Gulf of Maine, east coast of U.S.A. FISH 1926, pp. 123, 124: as *Syncoryne mirabilis*; Woods Hole. KRAMP 1926*a*, p. 8, Pl. 1, figs. 5–7, text-figs. 6–16: comparison with other species; Greenland; Iceland; Faeroes; Scotland; Norway. KRAMP 1927, p. 24: Denmark. UCHIDA 1927*a*, p. 179, fig. 23: as *S. mirabilis*; Japan. KRAMP 1928, p. 28: Vancouver Island. KRAMP 1930, p. 7: S.W. North Sea. SANDERSON 1930, p. 220: Northumberland coast, England. UCHIDA 1930, p. 330: as *S. mirabilis*; Japan. WATSON 1930, p. 233: Northumberland coast, England. MAR. BIOL. ASS. 1931, p. 79: Plymouth. RUNNSTRÖM 1932, p. 26: Herdla- and Hjeltefjord, Norway. THIEL 1932*a*, p. 126. THIEL 1932*b*, pp. 439 ff.: distribution; non KRAMP 1933*b*, p. 15: E. Greenland. UCHIDA 1933*a*, p. 126, fig. 1: as *S. princeps*?; S.W. Kamchatka. USSING 1933, pp. 50–54, figs. 1, 2: Denmark. HENSCHEL 1935, pp. 37, 40, 41, fig. 4: chemical reactions. KÜNNE 1935, p. 62; Baltic Sea. THIEL 1935*c*, p. 166: Black Sea. FROST 1937, p. 26: New Foundland Bank. KRAMP 1937*b*, p. 24, figs. 6, 7: (Denmark). KÜNNE 1937*a*, pp. 145, 149, 160, 162: North Sea. KÜNNE 1937*b*, p. 5: Baltic Sea. MOORE 1937, p. 48: Isle of Man. REMANE 1937, p. 212: Schlei, Western Baltic Sea. RUSSELL 1938*b*, pp. 413, 416, 417: Plymouth. UCHIDA 1938*b*, p. 37: Japan. UCHIDA 1938*c*, p. 48: Japan. KRAMP 1939*a*, p. 3: Iceland. KRAMP 1939*b*, p. 513, figs. 6–9. RUSSELL 1939*a*, p. 175: North Sea. HYMAN 1940, p. 282: as *S. mirabilis*; physiology; Puget Sound. UCHIDA 1940*a*, p. 282, fig. 2: Japan. DUNBAR 1942, p. 71: eastern arctic Canada. KRAMP 1942, p. 9: W. Greenland. KRAMP 1943, p. 5: S.E. Greenland. KRAMP 1947, p. 50: Faroes. YASHNOV 1948, p. 68, Pl. 18, fig. 2: Barents Sea; White Sea. FRASER 1949*b*, p. 66: northern North Sea. KÄNDLER 1950, p. 66: Fehmarnbelt, western Baltic Sea. KÜNNE 1952, pp. 7, 9, 30, 32, 37: S.E. North Sea. REES 1953*a*, p. 8: Herdlafjord, Norway. RUSSELL 1953, p. 55, Pl. 1, fig. 2, Pl. 2, fig. 6, text-figs. 21, 22A, B, 23A: British coasts. CHIU 1954*b*, p. 56: as *S. mirabilis*. SOUTHWARD 1954, p. 17: Irish Sea. KRAMP 1955*b*, p. 151. MACGINITIE 1955, p. 118: Point Barrow, Alaska. NAUMOV 1956*b*, p. 37. VANNUCCI 1956*b*, pp. 245, 248: Clyde Sea, Scotland. PETERSEN 1957, p. 26: between Newfoundland and southern Greenland; record from East Greenland by Kramp 1933*b* transferred to *S. princeps*. VALKANOV 1957, p. 17: Black Sea. AURICH 1958, p. 215: frequency of occurrence in S.E. North Sea. BOSSANYI 1958, pp. 356, 362: Northumberland, England. CARTHY 1958, p. 293: responses to stimuli. UCHIDA 1958, p. 163: Sado, Japan. KRAMP 1959*a*, pp. 78, 208, 209, 211, 215, 220, 221, 269, fig. 10: diagnosis; distribution. WERNER 1959*a*, p. 33: Port Erin, Isle of Man.

Sarsia turricula McCrady 1857

Doubtful species.

MCCRADY 1857, p. 36, Pl. 8, figs. 6–8: *S. turricula* n.sp.; Charleston Harbour, U.S.A. HARTLAUB 1907, p. 46: ? = *S. reticulata*; p. 53: ? = *Stauridium productum*. MAYER 1910, p. 57: ? = *S. mirabilis* var. *reticulata*.

Sarsia sp. *I* and *II* Menon 1932

Sarsia sp. *I*:

2 mm high, oval. Manubrium shorter than bell cavity; gonads surround entire manubrium. Tentacles with a bulbous enlargement very near the tip.

MENON 1932, p. 5, Pl. 1, fig. 2: *Sarsia* sp. *I*; Madras.

Sarsia sp. *II*:

Probably an *Euphysora*, maybe *E. annulata* Kramp.

MENON 1932, p. 5: *Sarsia* sp. *II*; Madras.

Sarsia spp,

LE DANOIS 1913*d*, p. 304, fig. 1: Thorshavn, Faroes. UCHIDA 1927*a*, p. 183, fig. 26: Misaki, Japan. SOUSA, SILVA & SANTOS-PINTO 1949, p. 223, Pl. 6, fig. 6: Portugal. LUBET 1954, p. 213: Arcachon, France. GANAPATI & NAGABHUSHANAM 1958, pp. 92, 94: as *Sarsia mirabilis*; Vizagapatam coast, India.

Genus ***Sarsiella*** Hartlaub 1907

Corynidae with two opposite tentacles with ocelli.

Type-species: *S. dinema* Hartlaub.

HARTLAUB 1907, p. 66: *Sarsiella* n.g. = *Dinema* Hckl. 1879. MAYER 1910, p. 44: as *Dicodonium*. HARTLAUB 1917, p. 393: retains the genus *Sarsiella*.

Sarsiella dinema Hartlaub 1907

3 mm high, 2 mm wide; exumbrella besprinkled with nematocysts; half-egg-shaped. Manubrium very long; gonad encircling entire manubrium, no apical canal. Two tentacles with ocelli; no rudimentary bulbs. Doubtful species.

HAECKEL 1879, p. 28: as *Dinema slabberi* van Beneden 1866; Normandy. HARTLAUB 1907, p. 67: *Sarsiella dinema* n.g., n.nom.; (Normandy; ?Mediterranean Sea). MAYER 1910, p. 47: as *Dicodonium dinema*; an abnormal *Sarsia*? HARTLAUB 1917, p. 393: retains *Sarsiella*. KRAMP 1959*a*, p. 83: only species retained in genus *Sarsiella*; diagnosis.

Genus ***Stauridiosarsia*** Mayer 1910

Corynidae with medusa similar to *Sarsia*, but hydroid with capitate and reduced filiform tentacles.

Type-species: *S. producta* (Wright).

WRIGHT 1858, p. 283, Pl. 7, figs. 6–8: *Stauridia* n.g. MAYER 1910, p. 64: *Stauridiosarsia* n. subgen. HARTLAUB 1917, p. 389: does not acknowledge *Stauridiosarsia*. STECHOW 1919, p. 7: discussion of the name.

Stauridiosarsia producta (Wright 1858) Mayer 1910.

10 mm high, 7 mm wide; thick walls. Manubrium cylindrical, as long as or shorter than bell cavity; usually a conical apical canal. Tentacles fairly long, with a small terminal knob and with large bulbs, each with an ocellus.

Wright 1858, p. 283, Pl. 7, figs. 6–8: as *Stauridia producta* n.sp. Mayer 1910, p. 65, text-figs. 28–30: *Sarsia* (*Stauridiosarsia*) *producta*; new subgenus; N.W. Europe. ?Neppi & Stiasny 1911, p. 398: as *Sarsia producta*; Trieste. ?Neppi & Stiasny 1913*b*, p. 34, Pl. 1, fig. 4: Trieste. Hartlaub 1917, p. 389: as *Stauridium productum*; does not acknowledge *Stauridiosarsia* Mayer. Ranson 1925*c*, p. 327: *Sarsia* (*Stauridiosarsia*) *producta*; English Channel. Rees 1936, pp. 135–42: comparison between *S. producta* and *Staurocoryne filiformis*. Kramp 1937*b*, p. 26: as *Sarsia producta*. Kramp 1947, p. 50: Kattegat (the hydroid). Vannucci 1949, p. 223, Pl. 1, figs. 1, 2: *Sarsia* (*Stauridiosarsia*) *producta*; Santos, Brazil. Vannucci 1951, p. 115: *Sarsia* (*Stauridiosarsia*) *producta*; Brazil. Russell 1953, p. 64, figs. 26A–C, 27A, B: Ilfracombe and Valencia, Ireland (only the hydroid). Naumov 1956*b*, p. 37: as *Stauridium productum*. Vannucci 1957*d*, p. 40: comparison with *Sarsia eximia*. Kramp 1959*a*, pp. 80, 215, 218, 219, 232, 234, fig. 19: diagnosis; distribution.

Family *TUBULARIIDAE*

Anthomedusae with a simple circular mouth; with four radial canals; with manubrium not extending beyond umbrella margin; with gonad completely surrounding manubrium; with four or fewer marginal tentacles, usually hollow; without ocelli on marginal bulbs. Hydroids *Tubularia*-like or *Corymorpha*-like.

Genus ***Ectopleura*** L. Agassiz 1862

Tubulariidae with two or four simple tentacles; with eight longitudinal rows of nematocysts on the exumbrella, extending from the four tentacle bulbs to apex.

Type-species: *E. dumortieri* van Beneden.

van Beneden 1844, p. 50: as *Tubularia*. L. Agassiz 1862, p. 343: *Ectopleura* n.g. Mayer 1910, p. 68: *Ectopleura*.

Ectopleura dumortieri (van Beneden 1844)

2–3 mm high, bell nearly spherical, gelatinous substance very thick; manubrium short and blunt, apical canal sometimes present; mouth-rim with nematocysts. Eight longitudinal tracks of nematocysts, issuing in pairs from the four marginal bulbs, reaching apex. Four tentacles with large basal bulbs and with prominent nematocyst clusters on abaxial side.

van Beneden 1844, p. 50, Pl. 2: as *Tubularia dumortieri* n.sp.; hydroid only. L. Agassiz 1862, p. 342: *Ectopleura dumortieri*. Mayer 1910, p. 69, Pl. 5, figs. 4, 5, Pl. 6, figs. 1, 1′, 2: *E. dumortieri* = *E. ochracea* Agassiz 1862; (N.W. Europe; N. American Atlantic coast). Vanhöffen 1911*a*, p. 197: Great Fishbay, S.W. Africa. Neppi & Stiasny 1913*b*, p. 37, Pl. 1, fig. 7: Trieste. Bigelow 1914*b*, p. 6: as *E. ochracea*, probably = *E. dumortieri*; New England, east coast of U.S.A. Hartlaub 1917, p. 398: discussion of synonyms. Vanhöffen 1920, p. 16: S.W. Africa. Foerster 1923, p. 238: Pacific coast of Mexico. Stechow 1923, p. 50: Mediterranean Sea. Fish 1926, p. 123: as *E. ochracea*; Woods Hole, east coast of U.S.A.

KRAMP 1930, p. 10: S.W. North Sea. MAR. BIOL. ASS. 1931, p. 79: Plymouth. KRAMP 1933*c*, p. 241: Hirtshals, Denmark. KRAMP 1937*b*, p. 34, fig. 11*b*: Denmark. RUSSELL 1938*b*, pp. 413, 416: Plymouth. THIEL 1938*c*, p 292, fig. 1: as *E. octogona* n.sp.; Fernando Po, Gulf of Guinea. SOUSA, SILVA & SANTOS-PINTO 1949, p. 223, Pl. 6, fig. 5: Portugal. NAIR 1951, p. 51: Trivandrum coast, India. RUSSELL 1953, p. 76, Pl. 3, figs. 5, 6, text-figs. 33A–C: British coasts. KRAMP 1955*a*, pp. 244, 310: *E. octogona* Thiel 1938 a young stage of *E. dumortieri*; Gulf of Guinea. WERNER & AURICH 1955, pp. 234–50, figs. 1–8: development of the hydroid; southern North Sea. VANNUCCI 1957*d*, pp. 37, 40, 84, 98, 99, 102, figs. 2, 3 (map and diagram): Brazil. AURICH 1958, p. 207, text-figs. 1–6: general distribution; occurrence in S.E. North Sea; development of actinula. CHOW & HUANG 1958, pp. 174, 189, Pl. 1, fig. 3: Chefoo, China. GANAPATI & NAGABHUSHANAM 1958, pp. 92, 94: Vizagapatam coast, India. KRAMP 1959*a*, pp. 88, 211, 214, 215, 216, 218, 219, 223, 227, 231, 234, 271, fig. 37: as *E. dumortieri*; p. 88, fig. 38: *E. octogona* Thiel, ? =*E. dumortieri*; diagnosis; distribution.

Ectopleura minerva Mayer 1900

2·5 mm high, pear-shaped, with a well developed apical projection; moderately thick. Manubrium pear-shaped, about 2/3 as long as bell cavity; a short, conical apical canal. Eight lines of nematocysts on umbrella. Two tentacles and two small tentacle bulbs; every tentacle with 6–9 nematocyst swellings upon abaxial side.

MAYER 1900*b*, p. 31, Pl. 16, fig. 38, Pl. 37, fig. 125: *Ectopleura minerva* n.sp.; Tortugas, Florida. MAYER 1910, p. 70, Pl. 5, fig. 3: presumes that *E. dumortieri* Graeffe 1884 from Trieste is identical with *E. minerva*. NEPPI & STIASNY 1913*b*, p. 37: doubtful if *E. dumortieri* Graeffe 1884 = *E. minerva*. NAIR 1951, p. 51: Trivandrum coast, India. KRAMP 1959*a*, pp. 88, 231, 272, fig. 38: diagnosis; distribution.

Ectopleura sacculifera Kramp 1957

3 mm high, slightly conical, jelly thick; exumbrella with eight nematocyst tracks issuing in pairs from the four marginal bulbs, continued almost to apex along the edges of eight prominent ridges. Manubrium half as long as bell cavity; the gonad surrounds the stomach and has four large interradial sac-shaped pouches. Two opposite moniliform tentacles and two rudimentary marginal bulbs.

KRAMP 1957*a*, pp. 7, 96, 105, Pl. 2, figs. 1–3: *Ectopleura sacculifera* n.sp.; eastern tropical Pacific.

Genus ***Eucodonium*** Hartlaub 1907

Tubulariidae with umbrella without pointed apical process; without exumbrellar nematocyst tracks; with stomach attached to a peduncle; with asexual budding; with four perradial tentacles, each with a terminal knob of nematocysts.

Type-species: *E. brownei* Hartlaub.

HARTLAUB 1907, p. 71: *Eucodonium* n.g. MAYER 1910, p. 68.

Eucodonium brownei Hartlaub 1907

1 mm high and wide, pyriform, with thin walls. Mouth a simple round opening; medusa buds on sides of stomach. Four equally developed tentacles, very thin, each with a large terminal knob of nematocysts.

Browne 1896, p. 473, Pl. 16, fig. 2: as *Dipurena* sp.; Plymouth, England. Hartlaub 1907, p. 71, fig. 67: *Eucodonium brownei* n.g., n.sp. Mayer 1910, p. 68, fig. 33. Neppi & Stiasny 1911, p. 557: Trieste. Neppi 1912, p. 718: Dalmatia. Neppi & Stiasny 1913*b*, p. 36, Pl. 1, fig. 6: Trieste. Hartlaub 1917, p. 393. Kramp 1927, p. 37: Kattegat, Denmark. Mar. Biol. Ass. 1931, p. 79: Plymouth. Kramp 1937*b*, p. 28, fig. 8*c*: (Denmark). Russell 1938*b*, pp. 413, 416: Plymouth. Berrill 1950, p. 306, fig. 7H: budding. Franc 1951, p. 27: St. Malo, French Channel coast. Russell 1953, p. 93, fig. 40: family uncertain; Plymouth; North Sea. Picard 1955*c*, pp. 95–7: refers *Eucodonium brownei* to Oceanidae; young stages are nearly identical to the medusa of *Ascidioclava*. Vannucci 1957*d*, pp. 37, 43, 87, 97, 101, 102, figs. 10, 11 (map and diagram): Brazil; family uncertain. Kramp 1959*a*, pp. 91, 215, 216, 219, 223, fig. 44: diagnosis; distribution.

Genus ***Euphysa*** Forbes 1848

Tubulariidae with 1–4 tentacles, unequally developed, but all of the same structure; no apical canal; apex rounded, dome-like; tentacles usually moniliform. Hydroid: *Heteractis*, where known.

Type-species: *E. aurata* Forbes.

Forbes 1848, p. 71: *Euphysa* n.g. Hartlaub 1907, p. 81: as *Corymorpha*. Mayer 1910, p. 35: as *Steenstrupia*. Kramp 1926*a*, pp. 29–31: *Euphysa* is separated from *Steenstrupia*; three species of *Euphysa: aurata, tentaculata* and *flammea*. Kramp 1928, p. 34: developmental series: *E. aurata, tentaculata, tetrabrachia, flammea* and *aponica*.

Euphysa aurata Forbes 1848

About 4 mm high, bell-shaped, fairly thick. Manubrium shorter than bell cavity. Gonad encircling almost whole length of stomach. One tentacle, moniliform.

Forbes 1848, p. 71, Pl. 13, fig. 3: *Euphysa aurata* n.g., n.sp.; Shetland Islands. Mayer 1910, p. 35: as *Steenstrupia aurata* (N.W. Europe; Mediterranean). Hadži 1911*c*, p. 186, text-figs. 28–30: as *E. mediterranea*; Adriatic Sea. Neppi 1912, p. 713: as *S. aurata*; Dalmatia. Bigelow 1914*b*, p. 5: *S. virgulata* A. Agassiz probably = *S. aurata*; Massachusetts Bay; Woods Hole. Kramp 1915, p. 18: as *S. aurata*; Great Belt and Kattegat. Int. Plankt. Catal. III 1916, p. 42: as *Corymorpha aurata*; Ireland. Hartlaub 1917, p. 394: as *C. aurata*. Dick 1919, p. 91: as *C. aurata*; Firth of Clyde. Kramp 1920*b*, p. 3: as *S. aurata*; northern Atlantic. Sverdrup 1921, p. 15, Pl. 1, fig. 5, Pl. 2, fig. 7: as *C. aurata*; Kristianiafjord, Norway. Peacock 1923, p. 94: as *S. aurata*; Cullercoats, Northumberland coast, England. Coy 1924, p. 55: as *S. aurata*; Cullercoats. Peacock 1924, p. 57: as *S. aurata*; Cullercoats. Kramp & Damas 1925, p. 247: Norway. Marshall 1925, p. 126: as *C. aurata*; Clyde. Kramp 1926*a*, p. 25, Pl. 1, figs. 10–11, text-figs. 21–22: W. Greenland. Kramp 1927, p. 38: Denmark. ? Uchida 1927*a*, p. 191: as *S. virgulata*?; Japan. Kramp 1930, p. 10: south-western North Sea. Sanderson 1930, p. 223: Northumberland coast, England. Watson 1930, p. 234: Northumberland coast, England. MAR. BIOL. ASS. 1931, p. 80: Plymouth. RUNNSTRÖM 1932, p. 27: Herdla- and Hjeltefjord, Norway. THIEL 1932*a*, p. 129. THIEL 1932*b*, pp. 439 ff.: distribution. KRAMP 1937*b*, p. 29, fig. 9*a*: (Denmark). KÜNNE 1937*b*, p. 6: Baltic Sea. MOORE 1937, p. 48: Port Erin, Isle of Man. PELL 1938, p. 922: as *S. aurata*; Adriatic Sea. REES 1938, p. 25, figs. 8–9: description of the hydroid *C. annulicornis*; Herdla, Norway. RUSSELL 1938*b*, pp. 413, 416, 417: Plymouth. THIEL 1938*c*, p. 290: Patagonian Bank. KRAMP 1942, p. 17: W. Greenland. YASHNOV 1948, p. 69, Pl. 18, fig. 6: north of Russia. KÄNDLER 1950, p. 66: Fehmarnbelt, Baltic Sea. FRANC 1951, p. 27: English Channel. KÜNNE 1952, p. 38: S.E. North Sea. REES 1953*a*, p. 8: Herdlafjord, Norway. RUSSELL 1953, p. 90, Pl. 3, fig. 2, text-figs. 35E, 38, 39: British coasts. VANNUCCI 1956*b*, p. 248: Clyde Sea, Scotland. AURICH 1958, p. 215: S.E. North Sea. BOSSANYI 1958, p. 361: Northumberland, England. CHOW & HUANG 1958, pp. 174, 189, Pl. 1, fig. 4: Chefoo, China. KRAMP 1958*a*, pp. 116, 127: Villefranche, Mediterranean. KRAMP 1959*a*, pp. 85, 208, 210, 211, 215, 216, 223, 225, 235, 238, 264, fig. 29: diagnosis; distribution. WERNER 1959*a*, pp. 33, 35: Port Erin, Isle of Man. WERNER 1959*b*, p. 239.

Euphysa australis von Lendenfeld 1884

2·5 mm high, 1·7 mm wide; half-egg-shaped and symmetrical. Manubrium cylindrical, half as long as bell cavity. One very long tentacle, moniliform, with large basal bulb; three rudimentary bulbs with a knob-shaped cluster of nematocysts. Doubtful species.

VON LENDENFELD 1884*a*, p. 586, Pl. 21, fig. 33: *Euphysa australis* n.sp.; New South Wales, Australia. MAYER 1910, p. 37: as *Steenstrupia australis*. KRAMP 1953, p. 309: can hardly be recognized as good species.

Euphysa flammea (Linko 1905)

12 mm high, 7 mm wide; walls fairly thin. Manubrium 2/3 of the length of the bell cavity, in whole length encircled by gonad. Four tentacles, with scattered groups of nematocysts, all alike in adult, but developed in succession, youngest stages with only one tentacle, the other added successively.

MAAS 1904, p. 13, Pl. 2, fig. 11: as *Tiara* sp.; Bear Island. LINKO 1905, p. 212: as *Sarsia flammea* n.sp.; Barents Sea. MAYER 1910, p. 64, fig. 27: as *S. flammea*; arctic seas; p. 119: as *Pandea maasi* n.sp.; (Bear Island). HARTLAUB 1913, pp. 251, 338: as *S. flammea*. KRAMP 1914, p. 405: as *S. brachygaster*; W. Greenland. HARTLAUB 1917, p. 409: as *S. flammea*. BIGELOW 1920, p. 4, Pl. 2, fig. 5: as *S. flammea*; Alaska. FOERSTER 1923, p. 221, Pl. 1, fig. 1: as *S. flammea*; distribution in W. America. KRAMP & DAMAS 1925, p. 244, figs. 1–3: as *S. flammea*; Vardø, Norway. KRAMP 1926*a*, p. 19, Pl. 1, figs. 12–14: as *Euphysa flammea*; W. Greenland. THIEL 1932*a*, p. 129. THIEL 1932*b*, pp. 439 ff.: distribution. BERNSTEIN 1934, pp. 8, 24: as *Sarsia flammea*; Kara Sea. RANSON 1936*b*, p. 48: Bear Island and Spitzbergen. FROST 1937, p. 26: Newfoundland. YASHNOV 1939, p. 113: Chukotsky Sea; Laptev Sea; Kara Sea. KRAMP 1942, p. 20: survey of general distribution; W. Greenland. YASHNOV 1948, p. 68, Pl. 18, fig. 4: Barents Sea; White Sea; Laptev Sea; Chukotsky Sea; Sea of Okhotsk. MACGINITIE 1955, pp. 93, 94, 117: as *Sarsia flammea*; Point Barrow, Alaska. NAUMOV 1956*b*, p. 37. GRAINGER 1959, pp. 470, 496: Iglooik, arctic Canada. KRAMP 1959*a*, pp. 85, 208, 209, 210, 211, 269, fig. 31: diagnosis; distribution.

Euphysa japonica (Maas 1909)

8 mm high or more; cylindrical, walls fairly thick. Manubrium broad, barrel-shaped or cylindrical, surrounded by gonad in almost entire length, as long as bell cavity. Tentacles moniliform, all alike, also in young stages.

MAAS 1909, p. 6, Pl. 1, fig. 1: as *Sarsia japonica* n.sp.; Japan. MAYER 1910, p. 720: as *S. japonica*. BIGELOW 1913, p. 4: as *S. japonica*; western Aleutians. HARTLAUB 1917, p. 382: as *S. japonica*. FOERSTER 1923, p. 236: as *S. japonica*. UCHIDA 1927*a*, p. 180, fig. 24: as *S. japonica*; Japan. KRAMP 1928, p. 30, figs. 2–7: as *Euphysa japonica*; Vancouver. THIEL 1932*a*, p. 130. THIEL 1932*b*, pp. 439 ff.: distribution. UCHIDA 1933*a*, p. 127, fig. 3: S.W. Kamchatka. UCHIDA 1940*a*, p. 283: Japan.

Euphysa tentaculata Linko 1905

6 mm high, cylindrical, moderately thick. Manubrium slightly shorter than bell cavity, in almost whole length covered by gonad. Tentacles moniliform, one long, two half as long, one small bulb opposite to the long tentacle.

LINKO 1905, p. 214: as *Euphysa tentaculata* n.sp.; Barents Sea. MAYER 1910, p. 42: identical with *Hybocodon pendula*? p. 53: identical with an abnormal specimen of *Sarsia tubulosa* var. *mirabilis*? HARTLAUB 1917, p. 394: as *Corymorpha tentaculata*, possibly identical with *C. pendula*. KRAMP 1926*a*, p. 22, Pl. 1, fig. 8, text-figs. 17–20: Kattegat, Denmark. KRAMP 1927, p. 42: Denmark. THIEL 1932*a*, p. 130. THIEL 1932*b*, pp. 439 ff.: distribution. KÜNNE 1935, p. 63: western Baltic. KRAMP 1937*b*, p. 30, fig. 9*b*: (Denmark). KÜNNE 1937*b*, p. 6: Baltic Sea. KRAMP 1942, p. 18: W. Greenland. YASHNOV 1948, p. 68, Pl. 18, fig. 5: Murman Coast. KÄNDLER 1950, p. 66: Fehmarnbelt, Baltic Sea. KRAMP 1959*a*, pp. 85, 208, 209, 210, 215, 220, 266, fig. 30: diagnosis; distribution.

Euphysa tetrabrachia Bigelow 1904

4 mm high, about half as wide, with well developed, blunt apical projection, side walls thin. Manubrium spindle-shaped, about as long as bell cavity; mouth tube free of gonad. One long tentacle with warts of nematocysts, and three short tentacles all alike.

BIGELOW 1904, p. 251, Pl. 1, fig. 1: *Euphysa tetrabrachia* n.sp.; Indian Ocean. MAYER 1910, p. 36, figs. 8, 9: as *Steenstrupia tetrabrachia*, probably identical with *Euphysora bigelowi* Maas 1905. BROWNE 1916*a*, p. 173: as *Euphysora tetrabrachia*. KRAMP 1928, p. 34: belongs to *Euphysa*.

Euphysa sp. Uchida 1927

1 mm high, 0·8 mm wide, uniformly thin. Four tentacles with rings of nematocysts, one by far the longest, two intermediate, one very short opposite the longest. Four large tentacle bulbs, with abaxial ocelli(!).

UCHIDA 1927*a*, p. 191: *Euphysa* sp.; Asamushi, Japan. UCHIDA 1927*b*, p. 217: Japan. UCHIDA 1938*b*, p. 38: Mutsu Bay, Japan.

Genus **Euphysilla** Kramp 1955

Tubulariidae without exumbrellar nematocyst tracks; with four equally developed tentacles with adaxial clusters of nematocysts; without a stomachal peduncle.

Type-species: *E. pyramidata* Kramp.

KRAMP 1955, p. 245: *Euphysilla* n.g.

Euphysilla pyramidata Kramp 1955

Diameter 2·3 mm, about the same height, walls fairly thin. Stomach pyramidal, with a broad, quadrate base. Four tentacles, rather short and stout, each provided with 5–7 prominent transversal clasps of nematocysts on their adaxial side and a spherical terminal knob.

KRAMP 1955*a*, p. 245, Pl. 1, fig. 1, Pl. 2, fig. 3: *Euphysilla pyramidata* n.g., n.sp.; Gulf of Guinea. KRAMP 1959*a*, pp. 90, 227, fig. 42: diagnosis; distribution.

Genus **Euphysora** Maas 1905

Tubulariidae with three short or rudimentary tentacles and one long tentacle which differs from the others not merely in size, but also in structure. Hydroids unknown.

Type-species: *E. bigelowi* Maas.

MAAS 1905, p. 6: *Euphysora* n.g. HARTLAUB 1907, p. 80: belongs to *Corymorpha*, subgenus *Euphysa*. MAYER 1910, p. 36: belongs to *Steenstrupia*. BROWNE 1916*a*, p. 173: retains *Euphysora*; discussion of the species: *E. bigelowi, tetrabrachia* and *valdiviae*. UCHIDA 1927*a*, p. 188: *Euphysora* is joined with *Euphysa*. KRAMP 1928, p. 34: discussion of the species: *E. bigelowi, normani, valdiviae* and *annulata* n.sp. *Euphysora* is retained. KRAMP 1948*b*, p. 19: discussion of the species, description of *E. furcata* n.sp.

Euphysora annulata Kramp 1928

2 mm high, 1·4 mm wide, barrel-shaped, with thin walls and a pointed apex with an apical canal. Stomach wide, as long as bell cavity. Principal tentacle long, moniliform, three short, cone-shaped tentacles, the one opposite the main tentacle larger than the two others.

KRAMP 1928, p. 39, fig. 13: *Euphysora annulata* n.sp.; Sunda Strait. MENON 1932, p. 6, Pl. 1, fig. 8: as *Sarsia* sp. *II*?; Madras. KRAMP 1948*b*, p. 20. KRAMP 1953, p. 263: N.E. Australia.

Euphysora bigelowi Maas 1905

Up to 13 mm high, with pointed apex terminating in a patch of small papillae. Main tentacle long, with several large nematocyst knobs in a unilateral, adaxial position and a distinct terminal knob, the three other perradial bulbs each with a short, pointed tentacle without nematocyst clusters.

MAAS 1905, p. 7, Pl. 1, figs. 1–3: *Euphysora bigelowi* n.g., n.sp.; Malay Archipelago. MAYER 1910, p. 36, fig. 9: as *Steenstrupia bigelowi*, probably identical with *E. tetra-*

brachia Bigelow 1904. Vanhöffen 1911*a*, p. 197: Nias Island. Vanhöffen 1913*b*, p. 7, Pl. 1, fig. 3: Hongkong. Browne 1916*a*, p, 174: Cargados Carajos; Alphonse Island, Indian Ocean. Uchida 1927*a*, p. 189, Pl. 10, fig. 3, text-fig. 28: as *Euphysa bigelowi*; Misaki; Seto, Wakayama. Kramp 1928, p. 35, figs. 8–12: Philippines; Sunda Strait. Lele & Gae 1935, p. 91: as *S. bigelowi*; Bombay. Uchida 1938*a*, p. 143: as *Euphysa bigelowi*; Amakusa, Japan. Uchida 1947*a*, p. 300: as *Euphysa bigelowi*; Palao Islands, Pacific. Kramp 1948*b*, p. 20. Nair 1951, p. 50: Trivandrum coast, India. Bal & Pradhan 1952, p. 76: as *Steenstrupia bigelowi*; Bombay. Kramp 1952, p. 3: Chile. Kramp 1953, p. 262: N.E. Australia. Chiu 1954*b*, pp. 51, 52, 55: China. Chow & Huang 1958, pp. 174, 189, Pl. 1, fig. 3: China. Ganapati & Nagabhushanam 1958, pp. 92, 94: Vizagapatam coast, India. Kramp 1958*b*, p. 340: the Nicobars. Yamazi 1958, p. 135: as *Euphysa bigelowi*; Tanabe Bay, Japan.

Euphysora furcata Kramp 1948

Up to 8 mm high and 6·5 mm wide, with pointed apex and fairly thin walls. Stomach barrel-shaped, 2/3 the length of the bell cavity, with broad, conical apical chamber; gonad encircling whole length of stomach. Canals thick, with large endoderm cells. Main tentacle long, twice bifurcated, with four knobs of nematocysts; opposite this a fairly long, filiform tentacle; two lateral tentacles, short and conical.

Kramp 1948*b*, p. 19, Pl. 1, figs. 7, 8: *Euphysora furcata* n. sp.; south of Newfoundland Bank. Kramp 1955*a*, p. 247: off Liberia, W. Africa. Kramp 1957*a*, pp. 5, 97, 125, Pl. 1, fig. 2: off E. Africa. Kramp 1959*a*, pp. 4, 89, 242, 246, 247, 251, 253, 256, 263, fig. 40*b*: West Africa from Canary Islands to Cape of Good Hope; West Indies; diagnosis, distribution.

Euphysora gigantea Kramp 1957

Umbrella globular, up to 26 mm high and wide, jelly very thick, umbrella cavity very narrow. Stomach almost cylindrical, up to 2/3 as long as bell cavity, almost whole length surrounded by the gonad. Only one marginal tentacle, very long and thin, carrying several bifurcated lateral branches separated by long intervals.

Kramp 1957*a*, pp. 6, 98, Pl. 1, figs. 3, 4: *Euphysora gigantea* n.sp.; southern Atlantic Ocean; Weddell Sea. Kramp 1959*a*, pp. 89, 253, 256, 261, 262, fig. 41: diagnosis; distribution.

Euphysora gracilis (Brooks 1882)

Up to 5 mm high, including the apical projection which is almost as long as the bell, slender and pointed. Stomach about as long as the bell cavity; gonad encircling whole length of stomach; apical canal narrow, extending almost to the top of the apical projection. Principal tentacle very long, moniliform and with prominent swellings at irregular intervals and with a distinct terminal knob; the opposite tentacle short, tapering, cone-shaped, the two others mere bulbs.

Brooks 1882, p. 144: as *Steenstrupia gracilis* n.sp.; North Carolina, U.S.A. Mayer

1900*b*, p. 29, Pl. 16, figs. 36, 37: as *Steenstrupia gracilis*; Tortugas, Florida. MAYER 1910, p. 31, Pl. 1, fig. 7: as *Steenstrupia rubra*, in part. VANHÖFFEN 1913*a*, p. 414: as *Steenstrupia rubra*; Tortugas (new record). BIGELOW 1915*b*, pp. 316, 318: as *Steenstrupia rubra*; off Delaware Bay, U.S.A. VANNUCCI 1957*d*, pp. 37, 41, 85, 96, 97, 98, 101, 102; figs. 8, 9 (map and diagram); as *Corymorpha gracilis*; Brazil. KRAMP 1959*a*, pp. 89, 211, 232, fig. 40*a*: referred to genus *Euphysora*; *E. gracilis* a distinct species.

Euphysora normani (Browne 1916)

2.5 mm high, 1.25 mm wide. Apical chamber high and conical. Main tentacle with a large, sac-like bulb and with three lateral knobs of nematocysts projecting from the tentacle, and a large terminal knob.

BROWNE 1916*a*, p. 174, Pl. 39, fig. 1: as *Steenstrupia normani* n.sp.; north of Chagos, Indian Ocean. KRAMP 1928, p. 35: *Euphysora normani*. KRAMP 1948*b*, p. 20.

Euphysora valdiviae Vanhöffen 1911

6·5 mm high, 5 mm wide. With a large, conical apical chamber. Exumbrella with anastomosing tracks of nematocysts. Main tentacle short, twice bifurcated, without clusters of nematocysts; three other tentacles short, conical, all alike.

VANHÖFFEN 1911*a*, p. 198, figs. 2, 2*a*: *Euphysora valdiviae* n.sp; W. of Sumatra. BROWNE 1916*a*, pp. 173, 175: comparison with '*Steenstrupia*' *normani*. KRAMP 1928, p. 35. KRAMP 1948*b*, p. 20: diagnosis. KRAMP 1957*a*, p. 5: comparison with *E. furcata*.

Genus ***Gotoea*** Uchida 1927

Tubulariidae with four radial canals, one well developed, hollow tentacle, and three short exumbrellar nematocyst pads at the bases of the radial canals without tentacles. Manubrium simple and without lips. Gonad encircling stomach but with sausage-like processes in the interradii.

Type-species: *G. typica* Uchida.

UCHIDA 1927*a*, p. 195: *Gotoea* n.g.

Gotoea similis Kramp 1959

3·5 mm high, 3 mm wide. Similar to *G. typica*, marginal bulbs much smaller, tentacle short and thick.

KRAMP 1959*a*, pp. 5, 90, 239, 240, Pl. 2, fig. 1: *Gotoea similis* n.sp.; St. Helena, Atlantic; may be identical with *G. typica*.

Gotoea typica Uchida 1927

3·3 mm high, 2·8 mm wide; nearly pyriform, flat-topped; thin walls. Manubrium large, about three-quarters as long as bell cavity; a round, simple mouth; gonad with four interradial sausage-like protuberances. One tentacle, about half as long as bell height, thick with a round terminal knob. No ocelli seen.

UCHIDA 1927*a*, p. 195, fig. 31: *Gotoea typica* n.g., n.sp.; Japan. KRAMP 1942, p. 27: comparison with *Paragotoea bathybia*. KRAMP 1957*a*, p. 7: comparison with *Ectopleura sacculifera*. YAMAZI 1958, p. 135: Tanabe Bay, Japan. KRAMP 1959*a*, p. 5: comparison with *Gotoea similis*.

Genus *Hybocodon* L. Agassiz 1862

Tubulariidae without pointed apical process to umbrella; with or without exumbrellar nematocyst tracks; with umbrella margin at oblique angle; with one simple or compound marginal tentacular bulb with 1–3 tentacles; remaining three perradial bulbs rudimentary. Hydroids *Tubularia*-like.

Type-species: *H. prolifer* L. Agassiz.

L. AGASSIZ 1862, p. 243: *Hybocodon* n.g., hydroid and medusa. HAECKEL 1879, pp. 33, 35: *Hybocodon*+*Amphicodon*. MAYER 1910, p. 37.

Hybocodon atentaculatus Uchida 1947

23 mm high, 25 mm wide, globular, very thick, subumbrellar cavity 10×8 mm. Manubrium flask-shaped, without lips. Four radial canals asymmetrical in length. A short nematocyst band from base of longest radial canal tapering upwards on exumbrella. No tentacles. Systematic position uncertain.

UCHIDA 1947*b*, p. 333, fig. 1: *Hybocodon atentaculatus* n.sp.; Sagami Bay, Japan.

Hybocodon forbesi Mayer 1894

3 mm high, ellipsoidal, oblique; of uniform thinness. No lines of nematocysts on exumbrella. Manubrium spindle-shaped and swollen, extending slightly beyond the velar opening. The only tentacle has a small base and a large terminal swelling with nematocysts. The bulb opposite the tentacle sometimes has a short, conical tentacle; no medusa buds. Systematic position doubtful.

MAYER 1894, p. 236, Pl. 1, fig. 1: *Hybocodon forbesii* n.sp.; Bahamas. MAYER 1910, p. 42, Pl. 1, fig. 8, Pl. 2, fig. 3: Tortugas, Florida. VANHÖFFEN 1913*a*, p. 414: Tortugas, Florida. UCHIDA 1927*a*, p. 193, fig. 30: Japan. MENON 1932, p. 5, Pl. 1, fig. 1: as *Hybocodon* sp.; Madras, India. NAIR 1951, p. 50, Pl. 1, fig. 1: Trivandrum coast and Madras, India (the same specimen as *Hybocodon* sp. Menon 1932). GANAPATI & NAGABHUSHANAM 1958, pp. 92, 94: Vizagapatam coast, India. YAMAZI 1958, p. 135: Tanabe Bay, Japan. KRAMP 1959*a*, pp. 87, 231, 270, fig. 36: diagnosis; distribution.

Hybocodon pendulus (L. Agassiz 1862)

5 mm high, pyriform, moderately thick, thickest at apex; exumbrella with five lines of nematocysts. Manubrium about as long as bell cavity. Tentacular bulb with one long tentacle and usually two short ones, moniliform; marginal bulbs small. No medusa buds.

L. AGASSIZ 1862, pp. 276, 343, Pl. 26, figs. 7–17: as *Corymorpha pendula* n.sp.; hydroid. MAYER 1910, p. 41, Pl. 2, fig. 2: as *Hybocodon pendula*; New England, U.S.A. BIGELOW 1914*b*, p. 5: New England. BIGELOW 1917, p. 303: near Cape Cod, east coast of N. America. HARTLAUB 1917, p. 394: as *C. pendula*, non *Hybocodon*. FISH 1926, p. 125: as *C. pendula*; Woods Hole, east coast of U.S.A. KRAMP 1926*a*, p. 22: probably not *Euphysa tentaculata*, as suggested by Hartlaub 1907. KRAMP 1942, p. 16: as *E. pendula*; systematic position doubtful. KRAMP 1959*a*, pp. 87, 211, 212, fig. 34: diagnosis; distribution.

Hybocodon prolifer L. Agassiz 1862

4 mm high, 3 mm wide; exumbrella with five meridional nematocyst tracks, two of which issue from the tentacular bulb. Stomach large, cylindrical, mounted upon a short, gelatinous peduncle, never reaching beyond umbrella margin; mouth surrounded by a ring of nematocyst batteries; gonad surrounding stomach, leaving peduncle and mouth free. The tentacular bulb with one or more moniliform tentacles and with medusa buds, at least in immature stages.

L. AGASSIZ 1862, pp. 243, 343, Pl. 23*a*, figs. 10, 11, Pl. 25, fig. 19: *Hybocodon prolifer* n.g., n.sp. MAYER 1910, p. 38, Pl. 2, fig. 1, Pl. 3, fig. 3, text-fig. 10: *Hybocodon prolifer*; p. 43: as *H. christinae* Hartlaub 1907; N.W. Europe; New England, U.S.A. BIGELOW 1913, p. 6: Dutch Harbour, N. Pacific. BIGELOW 1914*b*, p. 6: New England. HADŽI 1914, p. 288: budding. KRAMP 1915, p. 10: Great Belt and Kattegat, Denmark. INT. PLANKT. CATAL. III 1916, p. 42: as *H. prolifera*; England, Ireland; Sweden; Denmark. HARTLAUB 1917, p. 399: *H. gravidum* (Linko 1904) probably identical with *H. prolifer*. LEBOUR 1917, p. 161: Plymouth. DICK 1919, p. 91: Firth of Clyde. SVERDRUP 1921, p. 16, Pl. 1, fig. 4: Kristianiafjord, Norway. LEBOUR 1922, p. 661: food. ELMHIRST 1923, p. 20: hydroid and medusa; Clyde. FOERSTER 1923, p. 235: Dutch Harbour; Departure Bay. KRAMP & DAMAS 1925, p. 249: Norway. MARSHALL 1925, p. 126: Clyde. UCHIDA 1925*b*, p. 78, fig. 1: Japan. FISH 1926, pp. 123, 124: Woods Hole. KRAMP 1926*a*, p. 33, Pl. 1, fig. 9, text-figs. 29–34: Iceland; Faroes. KRAMP 1927, p. 45: Denmark. UCHIDA 1927*a*, p. 192, figs. 20, 21, 29: Japan. UCHIDA 1927*b*, p. 217: Japan. KRAMP 1930, p. 10: S.W. North Sea; Dover Strait. SANDERSON 1930, p. 224: Northumberland coast. WATSON 1930, p. 234: Northumberland coast. MAR. BIOL. ASS., 1931, p. 80: Plymouth. RUNNSTRÖM 1932, p. 27: Herdla- and Hjeltefjord, Norway. THIEL 1932*a*, p. 130: as *H. christinae*; p. 131: as *H. prolifer* and *H. pulcher*. THIEL 1932*b*, pp. 439 ff.: as *H. prolifer, pulcher* and *christinae*; distribution. UCHIDA 1933*a*, p. 128: S. W. Kamchatka. KÜNNE 1935, p. 63: Baltic Sea. FROST 1937, p. 26: Newfoundland. KRAMP 1937*b*, p. 35, fig. 12: (Denmark). KÜNNE 1937*b*, p. 6: Baltic Sea. MOORE 1937, p. 48: Port Erin, Isle of Man. RUSSELL 1938*b*, pp. 413, 416: Plymouth. UCHIDA 1938*b*, p. 38: Hokkaido to Kamchatka. KRAMP 1939*a*, p. 4: Iceland. UCHIDA 1940*a*, p. 283: Japan. DUNBAR 1942, p. 72, fig. 1: Hudson Strait. KRAMP 1942, p. 21: W. Greenland. YASHNOV 1948, p. 69, Pl. 18, fig. 7: *H. prolifer*; Pl. 18, fig. 8: as *H. christinae*; Barents Sea; Bering Sea; Sea of Okhotsk. BERRILL 1950, pp. 306, 308, fig. 7 I, O, P: budding. KÄNDLER 1950, p. 67: Fehmarnbelt, Baltic Sea. FRANC 1951, p. 27: St. Malo, Channel. FRASER 1951*b*, p. 77: E. of Shetland and Fair Isle. GOTTO 1951, p. 163: Ireland. DEEVEY 1952*b*, pp. 150, 151: Block Island Sound, east coast of U.S.A. FRASER 1952*b*, p. 104: northern North Sea. KÜNNE 1952, pp. 9, 32, 38: S.E. North Sea. RUSSELL 1953, p. 79, Pl. 3, figs. 3, 4, text-fig. 34: British coasts. CHIU 1954*b*, p. 56. SOUTHWARD 1954, p. 18: Irish Sea. NAUMOV 1956*b*, p. 37. VANNUCCI 1956*b*, pp. 245, 248: Clyde Sea, Scotland. AURICH 1958, p. 216, text-figs. 7–9: general distribution; occurrence in S.E. North Sea; development of actinula. KRAMP 1959*a*, pp. 86, 208, 209, 211, 215, 220, 221, 269, fig. 33: diagnosis; distribution. WERNER 1959*a*, pp. 33, 34: Port Erin, Isle of Man.

Hybocodon unicus (Browne 1902) Mayer 1910

3 mm high, 2 mm wide, bell-shaped; umbrella margin slightly oblique; exumbrella with scattered nematocysts. Manubrium almost as long as bell cavity, mounted upon a short peduncle; stomach for almost whole length surrounded by gonad. One solitary tentacle, moniliform, on a very small bulb placed between two large swellings of nematocysts on bell margin. No medusa buds.

BROWNE 1902, p. 276: as *Amphicodon unicus* n.sp.; Falkland Islands. MAYER 1910, p. 42: '*Hybocodon unicus* '. BROWNE & KRAMP 1939, p. 273, Pl. 15, figs. 2, 3: Falkland Islands. NAIR 1951, p. 50: Trivandrum coast, India. GANAPATI & NAGABHUSHANAM 1958, pp. 92, 94: Vizagapatam coast, India. KRAMP 1959*a*, pp. 87, 235, 237, 272, fig. 35: diagnosis; distribution.

Genus ***Paragotoea*** Kramp 1942

Tubulariidae with four radial canals; one well developed, solid tentacle terminating in a large knob of nematocysts, and three marginal bulbs of unequal size with or without tentacles; with simple annular gonad.

Type-species: *P. bathybia* Kramp.

KRAMP 1942, p. 26: *Paragotoea* n.g.

Paragotoea bathybia Kramp 1942

2 mm high, 3 mm wide, with flattened top and thin walls; numerous nematocysts on exumbrella; four radial canals. Four marginal bulbs, each with an ectodermal, abaxial spur; one stiff and solid tentacle with a large terminal knob of nematocysts.

KRAMP 1942, p. 26, figs. 7*a–c*: *Paragotoea bathybia* n.g., n.sp.; Davis Strait. KRAMP 1959*a*, pp. 5, 91, 238, 239, 240, fig. 43: Cape of Good Hope; diagnosis; distribution. RALPH 1959, pp. 171–7, 1 fig.: Bay of Biscay; description of adult with four tentacles successively developed; referred to new family, Paragotoeidae.

Genus ***Plotocnide*** Wagner 1885

Tubulariidae with scattered nematocysts on exumbrella; with four tentacles, solid, each with a large, terminal knob of nematocysts.

Type-species: *P. borealis* Wagner.

WAGNER 1885, p. 74: *Plotocnide* n.g. HARTLAUB 1907, p. 68: adds *Sarsia nodosa* Busch 1851. MAYER 1910, p. 106: refers *P. borealis* to genus *Protiara*. HARTLAUB 1913, p. 250: *P. borealis* is not a *Protiara*, but a Codonida. KRAMP 1942, p. 24: *P. incerta* (Linko) does not belong to this genus; *Plotocnide* belongs to Tubulariidae.

Plotocnide borealis Wagner 1885

3 mm high and almost as wide, apex rather thick, rounded. Manubrium about half as long as bell cavity, with a broad, dome-shaped apical chamber; without a peduncle; gonad a thick ring; mouth simple with a ring of nematocysts. Tentacle bulbs well developed; tentacles with solid endoderm and an oval terminal swelling studded with nematocysts.

WAGNER 1885, p. 74, Pl. 4, figs. 1, 2: *Plotocnide borealis* n.g., n.sp.; White Sea. MAYER 1910, p. 106: as *Protaria borealis*. HARTLAUB 1913, p. 250: does not belong to *Protiara*. THIEL 1932*a*, p. 127: systematic remarks. THIEL 1932*b*, pp. 439 ff.: distribution. ?UCHIDA 1933*a*, p. 128, fig. 2: ? as *Sarsia inabai* n.sp.; Kamchatka. YASHNOV 1939, pp. 108–9, 113, figs. 1–4: new description; Chukotsky Sea, Arctic Ocean. KRAMP 1942, p. 22, figs. 5, 6: new description; W. Greenland. YASHNOV 1948, p. 68, Pl. 18, fig. 3: White Sea; Chukotsky Sea; Sea of Okhotsk. BEYER 1955*a*, pp. 94–8, fig. 1: description; Oslofjord, Norway. NAUMOV 1956*b*, p. 37. EDWARDS 1958, p. 1564: Firth of Clyde, Scotland. KRAMP 1959*a*, pp. 91, 208, 215, 219, 266, 269, fig. 45: diagnosis; distribution.

Plotocnide incerta (Linko 1900)

3 mm high and wide; walls thick; exumbrella with scattered nematocysts. Manubrium almost reaching bell opening, almost completely covered by the gonad; well developed gastric peduncle. Four tentacles without terminal knob. Evidently *P. incerta* belongs to another genus.

LINKO 1900, p. 151, fig. 1: as (*Syndiction*?) *incertum* n.sp.; White Sea. MAYER 1910, p. 106: ?as *Protiara beroë* (Slabber); (*Syndiction*?) *incertum* Linko is possibly *Sarsia flammea*. THIEL 1932*a*, p. 128: systematic remarks. THIEL 1932*b*, pp. 439 ff. KRAMP 1942, p. 24: *P. incerta* belongs to Tubulariidae, but not to *Plotocnide*. KRAMP 1959*a*, pp. 91, 207, 208, 209, fig. 46: diagnosis; distribution.

Genus ***Steenstrupia*** Forbes 1846

Tubulariidae with one moniliform tentacle; with pointed apex and a well developed apical canal. Hydroid: *Corymorpha*.

Type-species: *S. nutans* (M. Sars).

M. SARS 1835, p. 6, Pl. 1, fig. 3: *Corymorpha* n.g., the hydroid. FORBES 1846, p. 287: *Steenstrupia*, the medusa. MAYER 1910, p. 29.

Steenstrupia nutans (M. Sars 1835)

Up to 6 mm high, 3–4 mm wide; with a high, conical apical projection. Manubrium about as long as bell cavity, upon a short, broad peduncle, surrounded by gonad in entire length; a long, narrow apical canal. One moniliform tentacle, very long, and three rudimentary bulbs.

M. SARS 1835, p. 6, Pl. 1, fig. 3: *Corymorpha nutans* n.sp.; hydroid; Norway. FORBES 1848, pp. 73, 74, Pl. 13, figs. 1, 2: as *S. rubra*; medusa. MAYER 1910, p. 31, figs. 4–7: as *S. rubra* in part; (N.W. Europe; Mediterranean). HADŽI 1911*c*, p. 182, figs. 23–7: Adriatic Sea. NEPPI 1912, p. 713: as *S. rubra*; Dalmatia. LE DANOIS 1913*d*, p. 306, figs. 3, 4: as *Corymorpha* (*Steenstrupia*) *nutans*; Shetland. NEPPI &

Stiasny 1913*b*, p. 28: as *S. rubra*, identical with *S. lineata* Leuck. and Hckl., *S. cranoides* Hckl.; Trieste. Int. Plankt. Catal. III 1916, p. 42: as *Corymorpha nutans*; Ireland. Hartlaub 1917, p. 393: as *Corymorpha nutans*; remarks about the name *Steenstrupia*. Lebour 1917, p. 161: as *S. rubra*; Plymouth. Pell 1918, p. 22: as *S. rubra*; Adriatic Sea. Dick 1919, p. 91: as *Corymorpha nutans*; Firth of Clyde. Sverdrup 1921, p. 16, Pl. 2, fig. 6: as *Corymorpha nutans*; Kristianiafjord, Norway. Lebour 1922, p. 661: as *S. rubra*; food. Elmhirst 1923, p. 20: as *Corymorpha nutans*; Clyde. Lebour 1923, p. 84: as *S. rubra*; food. Kramp & Damas 1925, p. 248: Norway. Marshall 1925, p. 126: as *Corymorpha nutans*; Clyde. Ranson 1925*c*, p. 324: as *S. rubra*, identical with *S. flaveola* Forb., *lineata* Leuck., *cranoides* Hckl., *galanthus* Hckl., *gracilis* Brooks; English Channel. Russell 1925, p. 781: as *S. rubra*; Plymouth. Kramp 1926*a*, p. 28, figs. 23–28: Iceland; Faroes. Kramp 1927, p. 43: Denmark. Russell 1927, p. 569: as *S. rubra*; Plymouth. Russell 1928, p. 83: as *S. rubra*; Plymouth. Sanderson 1930, p. 224: Northumberland coast. Mar. Biol. Ass. 1931, p. 80: Plymouth. Russell 1931*b*, p. 771, tab. 1: Plymouth. Ranson 1932*a*, p. 993: as *Corymorpha nutans*; English Channel. Runnström 1932, p. 27: Hjeltefjord, Norway. Thiel 1932*a*, p. 128. Thiel 1932*b*, p. 439 ff.: distribution. Russell 1933, p. 76, tab. 1: Plymouth. Thiel 1935*c*, pp. 165, 172: Black Sea. Ranson 1936*b*, p. 51: as *Corymorpha nutans*; Menton, Mediterranean. Kramp 1937*b*, p. 31, fig. 9*c*: (Denmark). Künne 1937*b*, p. 6: Baltic Sea. Moore 1937, p. 48: Port Erin, Isle of Man. Pell 1938, p. 922: as *S. rubra*; Adriatic Sea. Russell 1938*b*, pp. 413, 416, 419, 420, 436: Plymouth. Russell 1938*d*, p. 148, figs. 1–7: nematocysts. Kramp 1939*a*, p. 4: Iceland. Babnik 1948, p. 13: Adriatic Sea; p. 71: biological remarks. Kändler 1950, p.67: Fehmarnbelt, Baltic Sea. Franc 1951, p. 27: St. Malo, Channel. Bal & Pradhan 1952, p. 76: as *S. bigelowi*; Bombay, India. Künne 1952, p. 38: S.E. North Sea. Russell 1953, p. 84, Pl. 3, fig. 1, text-figs. 35A–D, 36, 37A–C: British coasts. Southward 1954, p. 18: Irish Sea. Kramp 1955*b*, p. 151: by Haeckel 1879 determined as *S. galanthus*. Vannucci 1956*b*, p. 249: Clyde Sea, Scotland. Aurich 1958, p. 215: as *C. nutans*; frequency of occurrence in S.E. North Sea. Kramp 1958*a*, pp. 117, 127: Villefranche, Mediterranean. Kramp 1959*a*, pp. 86, 215, 220, 223, fig. 32: diagnosis; distribution. Werner 1959*a*, pp. 33, 35: as *Corymorpha nutans*; Port Erin, Isle of Man. Werner 1959*b*, p. 239.

Steenstrupia sp. Uchida 1947

Uchida 1947*a*, p. 300: *Steenstrupia* sp.; Palao Islands; no description.

Family *PENNARIIDAE*

Anthomedusae with a simple circular mouth; with four radial canals; with manubrium not extending beyond umbrella margin; with gonads completely surrounding stomach; with four permanently rudimentary tentacles, usually reduced to mere bulbs, with or without ocelli. Hydroids: *Pennaria*.

Genus ***Pennaria*** Goldfuss 1820

Pennariidae with four permanently rudimentary tentacles, which as a rule are reduced to mere basal bulbs. Hydroid: *Pennaria*.

Type-species: *P. disticha* Goldfuss.

Goldfuss 1820, p. 89: *Pennaria* n.g.; hydroid. McCrady 1857, p. 152: medusa. Mayer 1910, p. 23.

Pennaria adamsia von Lendenfeld 1884

Medusa: ♂ 1·5 mm high, 0·7 mm wide. Four perradial tentacles about as long as diameter of bell, with well developed bulbs with minute ocelli. ♀ 1·5 mm high and wide. Tentacles rudimentary, without ocelli; bell cavity filled with eggs. Hydroid: *P. adamsia.*

von Lendenfeld 1884*a*, p. 595, Pl. 25, figs. 45–48, Pl. 26, fig. 49: *Pennaria adamsia* n.sp.; New. S. Wales, Australia. Mayer 1910, p. 27.

Pennaria armata Vanhöffen 1911

1·5–1·8 mm high and wide, globular, walls moderately thick. Manubrium globular, half as long as bell cavity. Two opposite large and two opposite small bulbs without trace of tentacles, but all with an exumbral prolongation grasping around margin and terminating with an ocellus. Hydroid unknown.

Vanhöffen 1911*a*, p. 199: *Pennaria armata* n.sp.; description; Nias Island; Great Nicobar, Indian Ocean. Vanhöffen 1913*b*, p. 7, Pl. 1, fig. 4: W. of Sandwich Islands, Pacific.

Pennaria disticha Goldfuss 1820

Medusa buds: similar to *P. tiarella*, without ocelli. The medusa seldom free. Hydroid: *P. disticha.*

Goldfuss 1820, p. 89: *Pennaria disticha* n.g., n.sp.; Mediterranean. Mayer 1910, p. 24, fig. 1: Naples; (Amboina). Kramp 1959*a*, p. 93: diagnosis.

Pennaria grandis Kramp 1928

5 mm high, 4·5 mm wide; barrel-shaped, walls thick. Manubrium barrel-shaped, 2/5 as long as bell cavity, mouth a wide, simple opening with a narrow out-turned edge. Four equally developed, narrow, perradial bulbs with prolongation grasping around bell margin; no ocelli. Hydroid unknown.

Kramp 1928, p. 29, fig. 1: *Pennaria grandis* n.sp.; Sunda Strait.

Pennaria pauper Kramp 1959

Medusa: 7·2 mm high, 3·7 mm wide, almost cylindrical, with a small conical apical projection with a narrow apical canal. Manubrium almost completely filling the subumbrella cavity, completely covered by the gonad. No traces of marginal bulbs; without ocelli.

Kramp 1959*a*, pp. 4, 93, 227, Pl. 1, fig. 1: *Pennaria pauper* n.sp.; Cape Verde Islands, West Africa.

Pennaria rosea von Lendenfeld 1884

Medusa: 2 mm high, 1 mm wide (newly liberated). Manubrium with ripe gonad fills the entire bell cavity. Four large rudimentary bulbs with external ocelli. Hydroid: *P. rosea.*

VON LENDENFELD 1884*a*, p. 594, Pl. 24, figs. 40, 42: *Pennaria rosea* n.sp.; New South Wales, Australia. MAYER 1910, p. 27: hydroid and medusa.

Pennaria tiarella (Ayres 1852)

Medusa: 2 mm high, ellipsoidal, thin. ♂ manubrium slender, ♀ distended with 4–5 large eggs. Four small rudimentary bulbs, no ocelli. Hydroid: *P. tiarella.*

AYRES 1852, p. 193: as *Globiceps tiarella* n.sp.; New England. MCCRADY 1857, p. 153: *Pennaria tiarella.* MAYER 1910, pp. 25, 487, 720, Pl. 1, figs. 2–5, text-fig. 2: (New England); Florida. BIGELOW 1914*b*, p. 5: New England. KRAMP 1959*a*, pp. 93, 211, 213, 231, fig. 50: diagnosis; distribution.

Pennaria vitrea Agassiz & Mayer 1899

3 mm high, walls thick and rigid. Manubrium flask-shaped in ♂, ♀ with large, pyriform eggs grouped in four interradial clusters. Four rudimentary tentacle bulbs; ocelli? Hydroid unknown.

AGASSIZ & MAYER 1899, p. 161, Pl. 1, figs. 1, 2: *Pennaria vitrea*; Fiji Islands. MAYER 1910, p. 28: *P.? vitrea.*

Family *MARGELOPSIDAE*

Anthomedusae without exumbrellar nematocyst tracks; with simple circular mouth without oral tentacles; with gonads completely surrounding stomach; with four radial canals; with solid, moniliform tentacles in perradial clusters on margin, or at different levels on exumbrella; without ocelli. Hydroids, where known, aberrant pelagic tubularians.

Genus ***Climacocodon*** Uchida 1924

Margelopsidae with pairs of solid tentacles at several levels. Eggs develop into actinulae on manubrium.

Type-species: *C. ikarii* Uchida.

UCHIDA 1924, p. 59: *Climacocodon* n.g.

Climacocodon ikarii Uchida 1924

1·1 mm high, 0·6 mm wide. In each perradius seven short tentacles at four levels.

UCHIDA 1924, pp. 59–65, figs. 1–3 (medusa), figs. 4–7 (hydroid): *Climacocodon ikarii* n.g., n.sp.; Japan. UCHIDA 1927*a*, p. 197, Pl. 10, fig. 5: Japan. DAWYDOFF 1936, p. 469: *Climacocodon*; Ha-Long Bay, French Indochina, invaded from Japanese waters. UCHIDA 1940*a*, p. 284: Japan. KRAMP 1949*b*, p. 209: discussion. BERRILL 1950, p. 308: *Climacodon* (misprint).

Genus ***Margelopsis*** Hartlaub 1897

Margelopsidae with four perradial clusters of tentacles on bell margin; actinulae. Hydroid: *Margelopsis.*

Type-species: *M. haeckeli* Hartlaub.

Hartlaub 1897, p. 482: *Margelopsis haeckeli* n.g., n.sp.; medusa; Heligoland. Hartlaub 1899, p. 219: hydroid. Browne 1903, p. 10: *M. hartlaubi* n.sp. Hartlaub 1903, p. 28: *M. stylostoma* n.sp.; *Nemopsis gibbesi* McCrady is included in *Margelopsis.* Hartlaub 1907, p. 88: *Margelopsis* a genus of Codonidae. Mayer 1910, p. 70: *Margelopsis* and *Pelagohydra* form the subfamily *Margelopsinae* of the family Codonidae. Browne 1910, p. 11: *M. australis* n.sp. Hartlaub 1917, p. 398: report and remarks about the genus *Margelopsis* and *Perigonimus sulphureus* Chun; contradicts Mayer. Uchida 1927, p. 196: new family Margelopsidae. Rees 1941*a*, p. 133: revision of family Margelopsidae. Kramp 1949*b*, p. 209: discussion.

Margelopsis australis Browne 1910

1–3 mm high and wide, almost globular. Manubrium cylindrical, almost as long as bell cavity; gonad a globular swelling around middle portion of manubrium. Four marginal bulbs very small, each with two small tentacles, placed one behind the other.

Browne 1910, p. 11, Pl. 4, figs. 6, 7: *Margelopsis australis* n.sp.; McMurdo Sound, Antarctic. Vanhöffen 1912, p. 356, Pl. 24, fig. 1: description; Antarctic. Thiel 1938*c*, p. 294: as *M. gibbesi*; between S. Georgia and Bouvet Island. Kramp 1959*a*, pp. 93, 235: diagnosis; distribution.

Margelopsis gibbesi (McCrady 1857)

2·5 mm high, bell-shaped, walls thin and uniform. Manubrium wide, shorter than bell cavity, whole length encircled by gonad; no apical canal in adult. Four marginal bulbs fairly large, each with 5–6 tentacles with rings of nematocysts and terminal knob. Hydroid pelagic.

McCrady 1857, p. 163, Pl. 10, figs. 4–7: as *Nemopsis gibbesi* n.sp.; Charleston Harbour, Carolina. Hartlaub 1903, p. 28: *Margelopsis gibbesi.* Mayer 1910, p. 82, Pl. 9, figs. 4–7: North and South Carolina. Thiel 1938*c*, p. 294: *M. hartlaubi, haeckeli* and *australis* probably synonyms. Kramp 1959*a*, pp. 92, 231, 233, fig. 48: diagnosis; distribution.

Margelopsis haeckeli Hartlaub 1897

2 mm high; pyriform with flat apex, walls very thick. Manubrium wide, spindle-shaped, length 2/3 of the bell cavity. A wide axial canal above stomach. Four marginal bulbs, each with 3–4 tentacles; the eggs develop into actinulae on the walls of the stomach. Hydroid pelagic.

Hartlaub 1897, p. 482, Pl. 16*b*, figs. 12–18: *Margelopsis haeckeli* n.g., n.sp.; Heligoland. Mayer 1910, p. 80, fig. 38. Kramp 1930, p. 12: Zeebrugge and Ostende, Belgium. Leloup 1930, p. 97: off Belgium. Kramp 1937*b*, p. 32, fig. 10. Thiel 1938*c*, p. 294: probably =*M. gibbesi.* Leloup 1946, pp. 1–3: indicator of the

Flemish coastal water. KRAMP 1949*b*, p. 209: discussion. BERRILL 1950, p. 308, fig. 7: budding. KÜNNE 1952, pp. 10, 30, 32, 34, 39: S.E. North Sea. RUSSELL 1953, p. 95, figs. 41–42. WERNER 1954*a*, pp. 143–6; development and reproduction; North Sea. WERNER 1954*b*, pp. 124–33, figs. 1–5: development and reproduction; North Sea. WERNER 1955, pp. 1–30, figs. 1–9: development. WERNER 1956*b*, pp. 541, 542: parthenogenetic development. AURICH 1958, p. 223, fig. 11: development; p. 215: frequency of occurrence in S.E. North Sea. KRAMP 1959*a*, pp. 92, 215, 218, 222, fig. 47: diagnosis; distribution. WERNER 1959*b*, p. 238.

Margelopsis hartlaubi Browne 1903

2–4 mm high and wide, egg-shaped, thick walls. Stomach large, conical, with a broad, flat, quadrangular base, no apical canal. Four small bulbs, each with two, occasionally three, tentacles with rings of nematocysts. Hydroid unknown.

BROWNE 1903, p. 10, Pl. 1, fig. 2, Pl. 3, fig. 3: *Margelopsis hartlaubii* n.sp.; Norway. MAYER 1910, p. 82, fig. 40. KRAMP & DAMAS 1925, p. 252, fig. 4: Herlöfjord, Norway. RUNNSTRÖM 1932, p. 27: Herdlafjord, Norway; seldom above 200 m. KRAMP 1937*b*, p. 33, fig. 11*a*. THIEL 1938*c*, p. 294: probably = *M. gibbesi*. REES 1953*a*, p. 8: Herdlafjord, Norway. KRAMP 1959*a*, pp. 92, 215, 218, 222, fig. 49: diagnosis; distribution.

Margelopsis spp.

GANAPATI & NAGABHUSHANAM 1958, pp. 92, 94: Vizagapatam coast, India.

Genus ***Pelagohydra*** Dendy 1902

Pelagic hydroid with medusa buds.

Type-species: *P. mirabilis* Dendy.

DENDY 1902, p. 1: *Pelagohydra* n.g. MAYER 1910, p. 83.

Pelagohydra mirabilis Dendy 1902

Medusa: 1 mm wide; four radial groups of marginal tentacles, each with five tentacles, the median smallest. Manubrium pyriform. Hydroid pelagic, medusae not seen free.

DENDY 1902, p. 1, Pl. 12: *Pelagohydra mirabilis* n.g., n.sp.; New Zealand. MAYER 1910, p. 83, fig. 40*a*. PERCIVAL 1938, p. 439: discovered at Sumner Beach, New Zealand. KRAMP 1949*b*, p. 209: discussion. BERRILL 1950, p. 308.

CODONIDA incertae sedis

Genus ***Microcampana*** Fewkes 1889

Codonida with six radial canals, one well developed and five rudimentary tentacles; hydroid unknown.

Type-species: *M. conica* Fewkes.

FEWKES 1889, p. 111: *Microcampana* n.g. MAYER 1910, p. 44.

Microcampana conica Fewkes 1889

Size unknown. Bell conical with pointed apical projection. Manubrium about as long as bell cavity; with apical canal. Well developed tentacle club-shaped.

FEWKES 1889, p. 111, Pl. 4, fig. 8: *Microcampana conica* n.g., n.sp.; Santa Cruz Islands, California. MAYER 1910, p. 44, fig. 11. FOERSTER 1923, p. 235.

Genus ***Pachycordyle*** Weismann 1883

Codonida without tentacles, radial canals or circular vessel. Manubrium surrounded by a ring-like gonad. Hydroid, where known: *Pachycordyle*. Degenerate forms, possibly of different origin.

Type-species: *P. weismanni* Hargitt.

WEISMANN 1883, pp. 87, 217: *Pachycordyle napolitana*; male hydroid with gonophores. HARGITT 1904, p. 553: *P. weismanni*; possibly = *P. napolitana*; medusa. MAYER 1910, p. 21: two species: *P. weismanni* Hargitt and *P. degeneratus* (Mayer). Weismann is stated as author to genus *Pachycordyle*, though the identity with Hargitt's is doubtful. KRAMP 1959*c*, p. 224: discussion.

Pachycordyle conica Kramp 1959

1·2 mm high, 1 mm wide, somewhat conical, with thick walls and a large, bluntly pointed apical projection; bell opening very large, velum extremely narrow. Manubrium about as long as the bell cavity, slender, spindle-shaped, without a peduncle, in entire length surrounded by a male gonad; a narrow apical canal reaches almost to the top of the apex.

KRAMP 1959*c*, p. 226, fig. 3: *Pachycordyle conica* n.sp.; Gulf of Panama.

Pachycordyle degenerata (Mayer 1904)

Ca. 0·75 mm high, 0·3 mm wide. Walls thin and rigid, velum powerful and well developed. Manubrium spindle-shaped, 1/3 as long as bell cavity. Deep conical cicatrice in top of bell.

MAYER 1904, p. 6, Pl. 3, fig. 22: *Parvanemus degeneratus* n.g., n.sp.; Bahamas. MAYER 1910, p. 21, Pl. 1, fig. 1: *Pachycordyle degeneratus*; possibly does not belong to genus *Pachycordyle*. KRAMP 1959*a*, pp. 94, 231, fig. 51: diagnosis; distribution. KRAMP 1959*c*, p. 224.

Pachycordyle globulosa Kramp 1959

Ca. 1 mm high and wide, almost globular, with thick walls, evenly rounded apically; velum very broad. Manubrium broadly oval, 2/3 as long as the bell cavity, completely filled with large, ripe eggs; a short cylindrical apical canal; no peduncle.

KRAMP 1959*c*, p. 225, fig. 1: *Pachycordyle globulosa* n.sp.; Philippines.

Pachycordyle lineata Kramp 1959

Ca. 0·5 mm high and wide, egg-shaped, with thin walls, velum very broad with a narrow opening, subumbrella with ten meridional grooves from bell margin almost to apex, equidistant, in each groove a black line. Manubrium without a peduncle, about as long as the bell cavity, cylindrical, somewhat dilated in apical portion, with black pigmentation throughout the length.

Kramp 1959*c*, p. 225, fig. 2*a*, *b*: *Pachycordyle lineata* n.sp.; Bali.

Pachycordyle weismanni Hargitt 1904

2 mm high, 1·3 wide, pyriform. Velum narrow, with a small opening. Manubrium large, conical, without a peduncle; ripe ova in the endoderm; mouth lacking. Lives only 1–2 hours.

Hargitt 1904, p. 553, Pl. 21, figs. 1–8: *Pachycordyle weismanni* n.sp.; Naples. Mayer 1910, p. 21. Kramp 1959*a*, pp. 94, 223, 226: diagnosis; distribution. Kramp 1959*c*, p. 224.

Genus **Propachycordyle** Thiel 1931

Codonida with a bell-shaped body; manubrium short, spherical; gonads in the ectoderm. Four radial canals, ring canal and velum are present; tentacles, tentacle bulbs and ocelli are lacking.

Type-species: *P. canalifera* Thiel.

Thiel 1931, p. 319: *Propachycordyle* n.g.

Propachycordyle canalifera Thiel 1931

Up to 2 mm high, 1·5 mm wide. Walls thin, velum broad. Manubrium one quarter as long as bell cavity.

Thiel 1931, p. 319: *Propachycordyle canalifera* n.g., n.sp.; intermediate form between *Pachycordyle* and *Amalthaea*; Weddell Sea, Antarctic. Kramp 1959*a*, pp. 94, 235, 236: diagnosis; distribution.

Family *ZANCLEIDAE* *

Anthomedusae with, or without, exumbrellar nematocysts confined to specialized tissue in form of oval or club-shaped patches or elongated tracks; with simple circular mouth, with or without oral tentacles; with four radial canals (rarely bifurcated); with interradial gonads; with two or four hollow marginal tentacles, each with abaxial stalked capsules (or cnidophores) containing nematocysts, or without marginal tentacles, with or without ocelli. Hydroids, where known, with irregularly distributed tentacles, capitate or filiform.

Genus **Ctenaria** Haeckel 1879

Zancleidae with four bifurcated radial canals; with two feathered marginal tentacles and simple, unbranched oral tentacles; eight adradial, meridional lines of nematocysts on exumbrella, and a nematocyst track above the base of each marginal tentacle. An apical cavity above stomach.

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* See Addenda, p. 444, on *Pteroclava*.

Type-species: *C. ctenophora* Haeckel.

HAECKEL 1879, p. 107: *Ctenaria* n.g. MAYER 1910, p. 98.

Ctenaria ctenophora Haeckel 1879

6 mm high, 5 mm wide. Bell three-fourths-egg-shaped.

HAECKEL 1879, p. 108, Pl. 7, figs. 5–7: *Ctenaria ctenophora* n.g., n.sp.; Japan. MAYER 1910, p. 98, fig. 52: *Ctenaria* belongs to subfamily Cladoneminae. UCHIDA 1927*a*, p. 199. RANSON 1937, p. 320: ‘ Cnidactines ’.

Genus ***Mnestra*** Krohn 1853

Zancleidae with four radial canals and a ring canal; no brood-sac and gonads; 0–4 degenerate, hollow tentacles with a row of nematocyst capsules along their aboral sides; rings of nematocysts around margin and four linear tracks of nematocysts on exumbrella above tentacles; throat blocked by a spongy mass of endoderm; a cup-like depression in centre of exumbrella.

Type-species: *M. parasites* Krohn.

KROHN 1853, p. 278: *Mnestra* n.g. MAYER 1910, p. 96.

Mnestra parasites Krohn 1853

Parasitized by the opisthobranch mollusc *Phyllirrhoë.* Probably identical with *Zanclea costata.*

KROHN 1853, p. 278: *Mnestra parasites* n.g., n.sp.; Mediterranean. MAYER 1910, p. 97, figs. 50–51: Florida. CAZIOT 1921, p. 114: as *M. parasitica*; Villefranche-sur-Mer, Mediterranean. ANKEL 1952, pp. 91–140, fig: relation of *Mnestra* to *Phyllirrhoë*; Naples. REES 1953*b*, p. 219: *Mnestra* probably identical with *Zanclea costata.* KRAMP 1959*a*, p. 95.

Genus ***Oonautes*** Damas 1936

8 adradial lines of nematocysts on exumbrella. Manubrium with three separated rings of tentacles. Family uncertain.

Type-species: *O. hanseni* Damas.

DAMAS 1936*b*, p. 1: *Oonautes* n.g.

Oonautes hanseni Damas 1936

3 mm high, egg-shaped. Exumbrella with eight adradial lines of nematocysts, which join to form four perradial tracks near the apex. Manubrium very thick, narrowed in the bell cavity and distally expanded again. Broad apical chamber. On the thick part of manubrium a ring of about nine short ten-

tacles, on the oral part two rings of somewhat larger tentacles. No marginal tentacles.

DAMAS 1936*b*, figs. 1–2: *Oonautes hanseni* n.g., n.sp.; off Morocco. KRAMP 1959*a*, pp. 95, 239, 240, fig. 54: diagnosis; distribution.

Genus ***Pteronema*** Haeckel 1879

Similar to *Zanclea*, but with a brood-sac above stomach; no meridional tracks of nematocysts upon exumbrella.

Type-species: *P. darwini* Haeckel.

HAECKEL 1879, p. 101: *Pteronema* n.g. MAYER 1910, p. 92.

Pteronema darwini Haeckel 1879

6 mm high, 4 mm wide, pyriform, with a pointed conical apex. Stomach spindle-shaped, with four simple lips. Four radial canals with jagged edges. Four tentacles, very long, with an abaxial row of side-branches with terminal nematocyst knobs; no ocelli.

HAECKEL 1879, p. 101, Pl. 7, figs. 1, 2: *Pteronema darwinii* n.g., n.sp.; Australia. MAYER 1910, p. 92, fig. 45.

Genus ***Zanclea*** Gegenbaur 1856

Zancleidae with exumbrellar nematocyst armature; without a brood-pouch above stomach; without oral tentacles; with four simple radial canals; with 2–4 tentacles with filiform branches carrying nematocyst capsules (cnidophores); without ocelli.

Type-species: *Z. costata* Gegenbaur.

GEGENBAUR 1856, p. 229: *Zanclea* n.g. MCCRADY 1857, p. 151: *Gemmaria* n.g. MAYER 1910, p. 85: *Gemmaria* = *Zanclea*. VANHÖFFEN 1911*a*, p. 199: revision of the genus. HARGITT 1912, pp. 815–18: discussion of *Gemmaria* and *Zanclea*. HARTLAUB 1917, p. 399: retains that *Gemmaria* = *Zanclea*. UCHIDA 1927*a*, p. 185: refers *Zanclea* to Codonidae. RUSSELL & REES 1936, pp. 107–30: revision of the species. RUSSELL 1953, p. 98: *Zanclea*; p. 104: historical review.

Zanclea costata Gegenbaur 1856

Up to 3 mm high and wide. Umbrella bell-shaped, jelly moderately thick; exumbrellar nematocysts in oval or club-shaped patches immediately above marginal bulbs or elongated meridional tracks towards summit. Manubrium shorter than bell cavity; gonads leaving mouth end free. Two opposite or four tentacles with elongated conical bases and with stalked capsules along their abaxial side.

GEGENBAUR 1856, p. 229, Pl. 8, text-figs. 4–7: *Zanclea costata* n.g., n.sp.; Mediterranean. MAYER 1910, p. 87, Pl. 8, figs. 2, 3, 6, 7, text-fig. 41: *Z. costata*; (Mediterranean); Tortugas, Florida; pp. 88, 489, Pl. 6, fig. 7, Pl. 7, fig. 5, text-fig. 42: as

Z. gemmosa; West Indies to Newport, New England; p. 89, text-figs. 43, 44: as *Z. implexa* (N.W. Europe; Mediterranean); p. 90: as *Z. cladophora*; North America Atlantic. VANHÖFFEN 1911*a*, p. 199, figs. 3, 3*a*: Red Sea; p. 200, figs. 4, 4*a*: as *Z. implexa*; Nicobars. NEPPI 1912, p. 719, Pl. 2, fig. 4: as *Z. implexa*; Dalmatia. NEPPI & STIASNY 1913*b*, p. 38: as *Z. implexa*; Trieste. VANHÖFFEN 1913*a*, p. 416: Tortugas, Florida. BIGELOW 1914*b*, p. 6: as *Z. gemmosa*; p. 7: as *Z. cladophora*; New England. BRÜCKNER 1914, pp. 460–502, Pl. 8, figs. 3–15, Pl. 9, figs. 16–25, figs. 7–24: as *Gemmaria implexa* var. *neapolitana*; description of hydroid and medusa; Naples. GROBBEN 1915, p. 5: Adriatic Sea. NEPPI 1915, p. 5: Adriatic Sea. HARTLAUB 1917, p. 400: *Z. costata, implexa* and *cladophora*; discussion. PELL 1918, p. 22: as *Z. implexa*; Adriatic Sea. FOERSTER 1923, p. 238: as *Z. gemmosa*; Pacific Mexico. FISH 1926, p. 123: as *Gemmaria cladophora*; Woods Hole. ?UCHIDA 1927*a*, p. 186: as *Zanclea* sp.; Japan. KRAMP 1930, p. 12: as *Z. implexa*; S.W. North Sea. MAR. BIOL. ASS. 1931, p. 79: as *Z. implexa*; Plymouth. RUNNSTRÖM 1932, p. 26: as *Z. implexa*; Hjeltefjord, Norway. RUSSELL & REES 1936, pp. 107–29, figs. 1–12: the medusae *Z. implexa* and *gemmosa* reared from the hydroid *Z. implexa*; p. 125: *Z. costata* is temporarily separated from *Z. gemmosa*. RANSON 1937, pp. 318 ff.: as *Z. implexa*; ‘Cnidactines’. PELL 1938, p. 922: as *Z. implexa*; Adriatic Sea. RUSSELL 1938*b*, pp. 413, 416, 417, 420: *Z. gemmosa – costata*; Plymouth. RUSSELL 1938*d*, p. 151, figs. 19–22: nematocysts. UCHIDA 1947*a*, p. 300: as *Z. gemmosa*; Palao Islands, Pacific. BABNIK 1948, p. 14: as *Z. implexa*; Adriatic Sea; p. 71: biological remarks. KRAMP 1953, p. 263: N.E. Australia. REES 1953*b*, p. 219: *Mnestra parasites* probably identical with *Zanclea costata*. RUSSELL 1953, p. 99, Pl. 4, figs. 1–3, text-figs. 43–48: *Z. cladophora, gemmosa* and *implexa* synonyms of *Z. costata*; British coasts. MAGHRABY & PERKINS 1956, p. 486: Whitstable, mouth of Thames. PICARD 1957, p. 5: systematic position. VANNUCCI 1957*d*, pp. 37, 45, 88, 99, 102: Brazil. CHOW & HUANG 1958, pp. 175, 189, Pl. 1, figs. 5, 6: Chefoo, China. KRAMP 1958*a*, pp. 117, 127: Villefranche, Mediterranean Sea. KRAMP 1959*a*, pp. 6, 94, 211–15, 218, 220, 223, 227, 231, 271, fig. 5: off Sierra Leone, W. Africa; diagnosis; distribution. KRAMP 1959*c*, p. 226: aberrant specimens with only one tentacle; Java Sea.

Zanclea dubia Kramp 1959

1·5 mm high, with thick jelly, evenly rounded apically. Manubrium very large, completely filling the bell cavity and reaching slightly beyond the bell opening, with four interradial gonads, each with two or three longitudinal rows of large eggs. Two large and two rudimentary marginal bulbs, but no tentacles.

KRAMP 1959*c*, p. 226, fig. 4: *Zanclea dubia* n.sp.; provisionally regarded as a separate species; Java Sea.

Zanclea orientalis Browne 1916

2 mm high, 1·5 mm wide; rounded summit, thin walls. Manubrium cylindrical, half as long as bell cavity, gonads interradial swellings on nearly whole length of stomach. Two opposite tentacles and two rudimentary bulbs. Four perradial patches of nematocysts upon bell margin, without any groove or streak leading to them.

BROWNE 1916*a*, p. 176, Pl. 39, figs. 2, 3: *Zanclea orientalis* n.sp.; north of Chagos, Indian Ocean. Russell 1953, p. 105: probably identical with *Z. costata*. Kramp 1959*c*, p. 228: comparison with *Z. dubia*.

Zanclea spp.

Sproston 1949, p. 139: Chusan, East China. Chiu 1954*b*, p. 50: China. Ganapati & Nagabhushanam 1958, pp. 92, 94: Vizagapatam coast, India.

Genus ***Zancleopsis*** Hartlaub 1907

Resembles *Zanclea*, but with large, stout lateral branches on the tentacles, each branch, as well as the tentacle itself, with a terminal club-shaped knob of nematocysts; with ocelli upon the tentacle bulbs; without meridional clusters of nematocysts on exumbrella. Manubrium cross-shaped in cross-section.

Type-species: *Z. dichotoma* (Mayer).

Hartlaub 1907, pp. 115, 116: *Zancleopsis* n.g. Mayer 1910, p. 91.

Zancleopsis dichotoma (Mayer 1900) Hartlaub 1907

3 mm high, 2·5 mm wide. Manubrium flask-shaped, cross-shaped, with four small, nematocyst-covered lips. Two well developed tentacles and two rudimentary bulbs; tentacles with 2–4 side-branches of varying lengths.

Mayer 1900*b*, p. 35, Pl. 17, fig. 40: as *Gemmaria dichotoma* n.sp.; Tortugas, Florida. Hartlaub 1907, p. 115, fig. 105: *Zancleopsis dichotoma* n.g. Mayer 1910, p. 91, Pl. 8, fig. 1. Hartlaub 1917, p. 399. Kramp 1928, p. 40: comparison with *Z. tentaculata*. Bigelow 1938, p. 102, figs. 1–2: description of an adult specimen; Bermudas. Kramp 1959*a*, pp. 95, 231, 233, fig. 53: diagnosis; distribution.

Zancleopsis tentaculata Kramp 1928

4·5 mm high, 2·8 mm wide. Stomach cross-shaped, about half as long as the bell cavity, gonads in vertical folds; mouth with four faintly indicated perradial lips. Two long tentacles, each with 2–3 hollow protuberances on the abaxial side; also two very small tentacles, terminating in a slight swelling; all four tentacle bulbs large, globular, with abaxial ocellus.

Kramp 1928, p. 40, figs. 14–18: *Zancleopsis tentaculata* n.sp.; Kei Islands.

Family *CLADONEMATIDAE*

Creeping and swimming Anthomedusae; with mouth with oral tentacles armed with nematocyst clusters; with stomach with radial pouches; with variable number of radial canals, some bifurcated, some simple; with gonads completely surrounding stomach; with variable number of hollow, branching marginal tentacles, each furnished with organs of adhesion; with ocelli. Hydroids with oral whorl of capitate tentacles, and usually with an aboral whorl of reduced filiform tentacles.

Genus *Cladonema* Dujardin 1843

Cladonematidae with simple, unbranched oral tentacles; without an apical cavity above stomach.

Type-species: *C. radiatum* Dujardin.

DUJARDIN 1843*b*, p. 370: *Cladonema* n.g. MAYER 1910, p. 98. RUSSELL 1953, p. 105: historical.

Cladonema californicum Hyman 1947

2–3 mm wide, a little shorter than wide. Manubrium longer than bell cavity, upper 3/4 spindle-shaped, carrying 6–7 gonads as rounded protrusions in a whorl; distal 1/4 narrow, with six short oral arms. About nine tentacles with one sucker-branch and 1–2 branches with nematocysts.

HYMAN 1947, p. 262, figs. 1–5: *Cladonema californica* n.sp.; California.

Cladonema myersi Rees 1949

Newly liberated medusa 0·7–0·8 mm wide; with 5–7 radial canals; tentacles much branched. Hydroid without filiform tentacles.

REES 1949, pp. 861–5, figs. 1–4: *Cladonema myersi* n.sp.; California. RUSSELL 1953, p. 110. HIRAI 1958, pp. 23–25: comparison with *C. radiatum* var. *mayeri* and *C. uchidai*.

Cladonema pacificum Naumov 1955

Up to 2 mm high and 2·2 mm wide. Manubrium about as long as bell cavity, with six radial protrusions and with six spherical oral tentacles; gonads along entire length of stomach; three simple and six paired radial canals issuing directly from base of stomach. Nine marginal tentacles, basal bulb with abaxial ocellus.

NAUMOV 1955*a*, p. 24, text-figs. 6, 8: as *C. pacifica* n.sp.; Saghalin Island, N. of Japan. NAUMOV 1956*b*, p. 37. NAUMOV 1957, pp. 165, 166, fig. 1: the polyp.

Cladonema radiatum Dujardin 1843

4 mm high, 3 mm wide, with fairly thin walls, rounded apex. Manubrium about as long as bell cavity, with four or five simple oral tentacles with terminal knobs. Gonad encircles stomach, with 4–5 radial sac-like protrusions; 8–10 radial canals reach the ring canal. 8–10 tentacles each with 4–6 branches with clusters of nematocysts and 1–4, usually three, basal branches with adhesive organs. Basal bulb with ocellus.

DUJARDIN 1843*a*, p. 1134: *Cladonema radiatum* n.g., n.sp. MAYER 1910, p. 99, figs. 53–5: *C. radiatum*; (W. Europe; Mediterranean); p. 101, Pl. 9, fig. 1: as *C. perkinsi* (Bahamas); p. 101, Pl. 9, figs. 2, 3: as *C. mayeri* (Florida). HADŽI 1911*b*, pp. 474–6, fig. 1. HADŽI 1911*c*, p. 158, figs. 6–18: Adriatic Sea. NEPPI & STIASNY 1913*b*, p. 39: Trieste. HARTLAUB 1917, p. 402: (Heligoland). LENGERICH 1922*a*, p. 210, fig. 1: as *Eleutheria radiata* = *C. mayeri* and *Dendronema stylodendron*; p. 211:

as *Eleutheria perkinsii*. LENGERICH 1923*b*, pp. 311–88: as *Eleutheria radiata* and *perkinsii*. UCHIDA 1925*b*, p. 81, fig. 7: *C. radiatum* var. *mayeri*; Japan. ZIRPOLO 1925, p. 287, Pl. 2, 3, text-figs. 1–13: as *E. radiata*; Naples. KRAMP 1927, p. 54: Denmark. SCHODDUYN 1927, p. 25: Boulogne-sur-Mer. UCHIDA 1927*a*, p. 200, Pl. 10, fig. 4: *C. radiatum* var. *mayeri*; Japan. UCHIDA 1927*b*, p. 218: *C. radiatum* var. *mayeri*; Japan. KRAMP 1928, p. 43: as *C. mayeri*; seems different from *C. radiatum*; Japan. THIEL 1935*c*, p. 165: Black Sea. WEILL 1936*a*, p. 816: cnidomes. KRAMP 1937*b*, p. 37, fig. 13: Denmark. WEILL 1937*b*, pp. 438–65, figs. 1-11: discussion of species; *C. radiatum – C. perkinsii* and *mayeri*; Bermuda. UCHIDA 1938*a*, p. 144: *C. radiatum* var. *mayeri*; Japan. UCHIDA 1938*b*, p. 38: *C. radiatum* var. *mayeri*; Japan. PASTEELS 1939*a*, pp. 1–7. PASTEELS 1939*b*, pp. 311–25: variation. UCHIDA 1940*a*, p. 284: *C. radiatum* var. *mayeri*; Akkeshi Bay, Japan. PASTEELS 1941, pp. 63–73, figs. 1–3: Belgium. BRIEN 1942, pp. 16–42: origin of sexual cells. BERRILL 1950, p. 311, figs. 9D–F. PICARD 1952*c*, p. 230: French Mediterranean coast. RUSSELL 1953, p. 105, figs. 49–51: British coasts; p. 110: historical review; *C. mayeri* and *perkinsii* probably races of *C. radiatum*. PICARD 1955*a*, p. 59: Villefranche, Mediterranean. HIRAI & KAKINUMA 1957*a*, pp. 49–53: C. *radiatum* var. *mayeri*; development; Asamushi, Japan. HIRAI & KAKINUMA 1957*b*, pp. 55–7: *C. radiatum* var. *mayeri*; Asamushi, Japan. VALKANOV 1957, p. 17: Black Sea. CHOW & HUANG 1958, pp. 175, 189, Pl. 1, fig. 7: as *C. mayeri*; Chefoo, China. HIRAI 1958, pp. 23–25: as *C. uchidai* n.sp.; Asamushi, Japan. UCHIDA 1958, p. 164: *C. radiatum* var. *mayeri*; Sado, Japan. YAMAZI 1958, p. 135: *C. radiatum* var. *mayeri*; Tanabe Bay, Japan. KRAMP 1959*a*, pp. 96, 215, 218, 219, 223, 231, 233, 265, 271, fig. 55: diagnosis; distribution.

Genus **Dendronema** Haeckel 1879

Cladonematidae with branched oral tentacles; with an apical cavity above stomach.

Type-species: *D. stylodendron* Haeckel.

HAECKEL 1879, p. 110: *Dendronema* n.g. MAYER 1910, p. 102.

Dendronema stylodendron Haeckel 1879

9 mm high, 6 mm wide.

HAECKEL 1879, p. 110, Pl. 7, fig. 8: *Dendronema stylodendron* n.g., n.sp; Canary Islands. MAYER 1910, p. 102. LENGERICH 1922*a*, p. 210: identical with *Cladonema radiatum*. KRAMP 1955*a*, p. 307: probably not = *C. radiatum*. KRAMP 1959*a*, p. 96.

Family *ELEUTHERIIDAE*

Creeping Anthomedusae with a continuous or broken thickened ring of nematocysts around umbrella margin; with simple circular mouth without oral tentacles; with variable number of radial canals which may or may not branch; with gonads on subumbrellar surface or in special dorsal brood pouch; with variable number of hollow bifurcating marginal tentacles, each furnished with an organ of adhesion; with abaxial ocelli; velum well developed. Hydroids with single oral whorl of capitate tentacles, with or without aboral whorl of reduced filiform tentacles.

Genus **Eleutheria** Quatrefages 1842

Eleutheriidae with a brood pouch above stomach; manubrium simple, mouth without lips or tentacles. Velum well developed. With four or more simple radial canals and a number of bifurcated tentacles, lower branch with a terminal adhesive disk, upper branch with a terminal cluster of nematocysts.

Type-species: *E. dichotoma* Quatrefages.

QUATREFAGES 1842, p. 168: *Eleutheria* n.g. MAYER 1910, p. 93. HARTLAUB 1917, p. 400: discussion. RUSSELL 1953, p. 110: type-genus of a new family, Eleutheriidae; p. 114: historical review.

Eleutheria claparedei Hartlaub 1889

0·4 mm high, 0·5 mm wide. 4–6 radial canals; medusa-buds from subumbrellar side of ring canal into bell cavity. 8–10 tentacles, not corresponding in position to the canals; tentacles bifurcate, one branch with adhesive disk, the other with nematocyst knob.

HARTLAUB 1889, p. 665: *Eleutheria claparedii* n.sp.; Naples. MAYER 1910, p. 95, fig. 49. MÜLLER 1911, pp. 159–69, Pl. 3, fig. 1: St Vaast la Hougue, Channel. DRZEWINA & BOHN 1912*a*, p. 393: development; Tatihou. DRZEWINA & BOHN 1913, p. 49, figs. 26–37: development and biology. HARTLAUB 1917, p. 401: as *Staurocladia claparedei.* LENGERICH 1922*a*, p. 211, fig. 2. LENGERICH 1923*b*, pp. 311–88. BROWNE & KRAMP 1939, p. 274: *E. claparedei* is not a *Staurocladia.* KRAMP 1959*a*, pp. 97, 215, 216, 223, fig. 57: diagnosis; distribution.

Eleutheria dichotoma Quatrefages 1842

0·3 mm high, 0·5 mm wide. Six radial canals, medusa buds on exumbrellar side of ring canal. Up to 14 tentacles, usually 5–6, bifurcated, one branch with adhesive disk, the other with nematocyst knob.

QUATREFAGES 1842, p. 168: *Eleutheria dichotoma* n.g., n.sp. MAYER 1910, p. 94, fig. 48: (N.W. Europe; Mediterranean). DRZEWINA & BOHN 1911, pp. 1030–2: Concarneau. MÜLLER 1911, pp. 159–69, tab. III, figs. 2, 3: comparison with *E. claparedei*; St Vaast la Hougue, English Channel. NEKRASOFF 1911, p. 759, figs. 1–7: budding. BRAEM 1912, p. 322: critic of Nekrasoff. DRZEWINA & BOHN 1912*b*, pp. 1027–9: Concarneau. DRZEWINA & BOHN, 1913, p. 17, figs. 1–25: development and biology. NEPPI & STIASNY 1913*b*, p. 39: Trieste. LENGERICH 1922*a*, p. 214, fig. 4: *E. dichotoma* = *E. krohni* Krumb. 1907. LENGERICH 1923*a*, pp. 64–65: as *E. radiata*; ectodermal budding. LENGERICH 1923*b*, pp. 311–88. KRAMP & DAMAS 1925, p. 253: Norway. MAR. BIOL. ASS. 1931, p. 80: Plymouth. THIEL 1935*c*, p. 165: Black Sea. WEILL 1936*a*, pp. 816–18: cnidomes. KRAMP 1937*b*, p. 39, fig. 14. BERRILL 1950, p. 311, figs. 9G, H. PICARD 1952*c*, p. 230. RUSSELL 1953, p. 110, Pl. 4, figs. 4–6, text-figs. 52, 53: British coasts. HAUENSCHILD 1956, pp. 394–402, figs. 1–8: asexual reproduction; Rhodos. HAUENSCHILD 1957*a*, pp. 412–13. HAUENSCHILD 1957*b*, pp. 472–7. KRAMP 1959*a*, pp. 97, 215, 223, fig. 56: diagnosis; distribution.

Genus ***Staurocladia*** Hartlaub 1917

Eleutheriidae adapted for crawling or walking. No brood pouch above stomach. Gonads well developed, in ectodermal interradial pockets around stomach. Sexes separate. Asexual budding may occur. Usually six radial canals. Tentacles numerous, increasing with age, dichotomous, the upper branch with several clusters of nematocysts. No oral tentacles.

Type-species: *S. vallentini* (Browne).

HARTLAUB 1917, p. 401: *Staurocladia* n.g.; *Eleutheria vallentini* Browne (1902) as genotype. GILCHRIST 1918, pp. 509–29: the southern species of *Eleutheria* are distinguished in a new genus *Cnidonema*. BROWNE & KRAMP 1939, p. 274: the name *Staurocladia* is stated, discussion of species.

Staurocladia acuminata (Edmonson 1930)

0·8 mm wide. Up to 24 tentacles. Upper branch of about same size as the lower, very pointed; two nematocyst clusters on upper side of tentacle, one on lower side and one on each side, laterally. Radial canals?

EDMONSON 1930, p. 9, fig. 4*a*, *b*: *Eleutheria acuminata* n.sp.; Hawaii. BROWNE & KRAMP 1939, p. 277: *Staurocladia acuminata*; discussion. HARADA 1954*a*, p. 83: as *Eleutheria*; Shimoda, Japan. HARADA 1954*b*, pp. 105–7: as *Eleutheria*; Shimoda, Japan. HARADA 1957, pp. 47–50: *S. acuminata*; Japan.

Staurocladia alternata (Edmonson 1930)

Diameter 0·8 mm. Margin of umbrella overhanging base of tentacles. Eight radial canals. Up to 13 tentacles; six clusters of nematocysts in two alternating lines, only on upper side; upper branch a little longer than lower.

EDMONSON 1930, p. 10, fig. 5*a*, *b*: as *Eleutheria alternata* n.sp.; Hawaii. BROWNE & KRAMP 1939, p. 277: *Staurocladia alternata*; discussion.

Staurocladia bilateralis (Edmonson 1930)

Diameter 0·6 mm. About 12 tentacles, upper branch a little longer than lower; nematocyst clusters on tentacles, one meridional on upper side, two laterally opposite each other, proximal of the meridional nematocyst cluster. Budding.

EDMONSON 1930, p. 8, fig. 3*a*, *b*: as *Eleutheria bilateralis* n.sp.; Hawaii. BROWNE & KRAMP 1939, p. 277: *Staurocladia bilateralis*; discussion.

Staurocladia capensis (Gilchrist 1918)

Diameter 1–3·3 mm. Six radial canals. Up to 40 tentacles; upper branch, when stretched, three times longer than lower; nematocyst clusters on upper branch of tentacles, meridionally, two, seldom three on upper side, one on underside. Medusa buds on small individuals.

GILCHRIST 1918, p. 509, Pl. 30: as *Cnidonema capensis* n.sp.; Cape of Good Hope. BRIGGS 1920, p. 93: as *C. capense*. EDMONSON 1930, p. 11: *C. capensis* = *Eleutheria vallentini*. BROWNE & KRAMP 1939, p. 277: *Staurocladia capense*; discussion. KRAMP 1959*a*, pp. 98, 227, 230, fig. 59: diagnosis; distribution.

Staurocladia charcoti (Bedot 1908)

1 mm high, 4 mm wide; about 10 radial canals. About 35 tentacles, upper branch with about nine pairs of nematocyst clusters, laterally situated, and a terminal cluster.

BEDOT 1908, p. 1, Pl. 1: as *Wandelia charcoti* n.g., n.sp.; Wandel Island. BROWNE 1910, p. 26: as *Eleutheria charcoti*. VANHÖFFEN 1911*a*, p. 201: identical with *Eleutheria vallentini*; doubtful that branches of radial canals are present. GILCHRIST 1918, pp. 520, 527: as *Cnidonema charcoti*. BROWNE & KRAMP 1939, p. 277: *Staurocladia charcoti*; discussion. KRAMP 1959*a*, p. 98, fig. 60: diagnosis.

Staurocladia haswelli (Briggs 1920)

Diameter 1·2 mm. Up to 31 tentacles, upper branch shorter than lower; nematocyst clusters meridionally, two on upper side and one on underside. Medusa buds on bell margin.

BRIGGS 1920, p. 97, Pl. 17, figs. 1–4, Pl. 18, figs. 1–5: as *Cnidonema haswelli* n.sp.; Port Jackson, Australia. EDMONSON 1930, p. 11: *C. haswelli* = *Eleutheria vallentini*. BROWNE & KRAMP 1939, p. 277: *Staurocladia haswelli*; discussion.

Staurocladia hodgsoni (Browne 1910)

Diameter 1·5–2 mm. 6–11 radial canals. 20–32 tentacles, upper branch, when stretched, about as long as lower. No continuous ring of nematocysts, but patches of nematocysts on the basal portion of the tentacles. 5–6 pairs of lateral clusters of nematocysts.

BROWNE 1910, p. 28, Pl. 3, figs. 1–4: as *Eleutheria hodgsoni*; McMurdo Sound, Antarctic. VANHÖFFEN 1911*a*, p. 201: identical with *E. vallentini*; doubts that the ring of nematocysts is segmented in isolated patches. GILCHRIST 1918, pp. 520, 527: as *Cnidonema hodgsoni*. LENGERICH 1923*b*, p. 345: identical with *E. vallentini*. BROWNE & KRAMP 1939, p. 277: *Staurocladia hodgsoni*; discussion. KRAMP 1948*a*, p. 2: South Georgia. MANN 1950, pp. 7, 8, text-figs: Graham Land, Antarctic. KRAMP 1959*a*, pp. 98, 235, 269, fig. 61: diagnosis; distribution.

Staurocladia kerguelensis (Gilchrist 1918)

Diameter up to 5·5 mm, commonly 1–2 mm. 6–10 radial canals. 20–60 tentacles, upper branch shorter than lower; clusters of nematocysts laterally placed, up to eight pairs.

VANHÖFFEN 1911*a*, p. 201, Pl. 22, figs. 1, 2, text-figs, 5*a*, *b*, *c*, *d*: as *Eleutheria vallentini*; Gazellehafen, Kerguelen Island. VANHÖFFEN 1912, p. 357: as *E. vallentini*; Kerguelen Island. GILCHRIST 1918, p. 521: as *Cnidonema kerguelensis* n.sp.

for Vanhöffen's specimens from Kerguelen. Lengerich 1920, pp. 527–39, figs. 1–10: as *E. vallentini*. Lengerich 1922*a*, p. 212, fig. 3: as *E. vallentini*. Lengerich 1923*b*, p. 345, figs. c^2, g^1–q^1: as *E. vallentini*. Browne & Kramp 1939, p. 277: *Staurocladia kerguelensis*; discussion. Kramp 1957*b*, pp. 155, 162: Kerguelen Islands (new record).

Staurocladia oahuensis (Edmonson 1930)

Diameter 0·5 mm. Eight radial canals. Up to 18 tentacles, upper branch longer than lower; nematocyst clusters meridional, two on upper side, none on underside. Propagation by sagittal division.

Edmonson 1930, p. 3, figs. 1*a*, *b*, 2*a–d*: as *Eleutheria oahuensis* n.sp.; Hawaii. Browne & Kramp 1939, p. 277: *Staurocladia oahuensis*; discussion. Kramp 1952, p. 3: Chile.

Staurocladia vallentini (Browne 1902)

2 mm high, 3 mm wide. 24 tentacles with two branches, lower branch with terminal sucker, upper branch with clusters of nematocysts, up to three on the upper side, one or two on the lower side, alternately placed, besides a terminal cluster.

Browne 1902, p. 279: *Eleutheria vallentini* n.sp.; Falkland Islands. Mayer 1910, p. 96: as *E. vallentini*. Müller 1911, p. 165, Pl. 3, fig. 4: as *E. vallentini*. non Vanhöffen 1911*a*, p. 201, Pl. 22, figs. 1, 2, text-figs. 5*a–d*. Hartlaub 1917, p. 401: *Staurocladia vallentini*, genotype. Gilchrist 1918, pp. 509–29: as *Cnidonema vallentini* n.g.; identical with *C. kerguelensis*. Lengerich 1920, pp. 527–39, figs. 1–10: as *E. vallentini*. Lengerich 1922*a*, p. 212, fig. 3: as *E. vallentini*. Lengerich 1923*b*, pp. 311–88: as *E. vallentini*. ?Weill 1937*a*, pp. 281–5, figs: as *Eleutheria* (*Cnidonema*) *vallentini*; discussion of species; Bermudas. Browne & Kramp 1939, p. 274, Pl. 14, figs. 3, 4, Pl. 15, fig. 4, Pl. 19, fig. 2: *Staurocladia vallentini*; discussion and comparison with other species; Falkland Islands. Ralph 1947, pp. 414–20, figs. 1–6: as *Cnidonema vallentini*; all southern species probably –*vallentini*; Wellington, New Zealand. Kramp 1959*a*, pp. 98, 230, 235, 237, 269, fig. 58: diagnosis; distribution.

Family *CYTAEIDIDAE*

Anthomedusae with simple circular mouth; with simple unbranched oral tentacles or four clusters of cnidophores; with interradial gonads; with four simple radial canals; with four solid marginal tentacles; without ocelli. Hydroid *Podocoryne*-like.

Genus ***Cnidostoma*** Vanhöffen 1911

Cytaeididae with four clusters of cnidophores on the mouth-rim.

Type-species: *C. fallax* Vanhöffen.

Vanhöffen 1911*a*, p. 205: *Cnidostoma* n.g.

Cnidostoma fallax Vanhöffen 1911 *

2·5 mm high and wide, pyriform, with thick dome-shaped apex. Manubrium small, stomach with several medusa buds, mouth with four clusters of petiolate cnidophores (gonads not seen). Four slender marginal tentacles with small, globular basal bulbs with an adaxial ocellus.

Vanhöffen 1911*a*, p. 205, fig. 7*a–c*: *Cnidostoma fallax* n.g., n.sp.; off the mouth of Congo. Kramp 1959*a*, pp. 99, 227, 228. Kramp 1959*b*, p. 5: mouth of Congo, new record.

Genus *Cytaeis* Eschscholtz 1829

Cytaeididae with four or more simple, unbranched oral tentacles.

Type-species: *C. tetrastyla* Eschscholtz.

Eschscholtz 1829, p. 104: *Cytaeis* n.g. Mayer 1910, p. 132: *Cytaeis* identical with *Nigritina* Steenstrup 1837, *Cubogaster* Haeckel 1879. Komai 1931, pp. 255–8: the hydroid (of *C. japonica*). Kramp 1953, p. 263: discussion of species; historical review.

Cytaeis pusilla Gegenbaur 1856

4 mm high, 3 mm wide. Stomach oval, conical peduncle as long as stomach; 12–24 oral tentacles. Tentacle bulbs small. Doubtful species.

Gegenbaur 1856, p. 228, Pl. 8, fig. 8: *Cytaeis pusilla* n.sp.; Mediterranean. Mayer 1910, p. 134, fig. 73. Hartlaub 1911, p. 139: ?Synonym of *C. tetrastyla*. Neppi & Stiasny 1911, p. 399: Trieste. Neppi & Stiasny 1913*b*, p. 45: Trieste. Browne 1916*a*, p. 177. Kramp 1953, p. 263: doubtful species. Vannucci 1957*d*, p. 52: may be a valid species. Kramp 1959*a*, p. 99: doubtful synonym of *C. tetrastyla*.

Cytaeis tetrastyla Eschscholtz 1829

6 mm high, 5 mm wide. Stomach very large, numerous medusa buds on upper half. 8–32 oral tentacles each with a terminal cluster of nematocysts. Tentacle bulbs large, pyriform, on exumbrella above the tentacles.

Eschscholtz 1829, p. 104, tab. VIII, fig. 2: *Cytaeis tetrastyla* n.g., n.sp. Bigelow 1909*a*, p. 190, Pl. 6, fig. 3, Pl. 40, figs. 2, 5, Pl. 43, fig. 4: as *C. vulgaris*; eastern tropical Pacific. Mayer 1910, p. 133, text-figs. 71–3: *C. tetrastyla* (Mediterranean; eastern tropical Pacific); *C. atlantica* (Steenstrup 1837) = *C. macrogaster* and *C. nigritina* Haeckel 1879 (Mediterranean; tropical Atlantic); p. 134: as *C. vulgaris* in parte (Malayan Archipelago); p. 135: as *C. herdmani* (Ceylon). Hartlaub 1911, p. 139, figs. 127–9: as *C. vulgaris* Ag. & M. 1899 and *C. herdmani* Browne 1905 ? = *C. tetrastyla* (Mediterranean; tropical Atlantic; Indian Ocean; Malay Archipelago; eastern tropical Pacific; Japan). Vanhöffen 1911*a*, p. 204, fig, 6: West Africa; coast of Somali; Nias; Seychelles; Sumatra; Chagos; Suadiva Atoll. Vanhöffen 1912, p. 358: between Ascension and St Helena. Vanhöffen 1913*b*, p. 8, Pl. 1, fig. 5: Cape Verde Islands; Panama; Galapagos Islands; Galapagos–Callao; Callao–Honolulu. Mayer 1915*a*, p. 200, Pl. 1, fig. 2: as *C. atlantica*; Torres Strait. Browne 1916*a*, p. 177: *C. herdmani* = *C. tetrastyla*; p. 178: north of Chagos; Saya de Malha Banks. Hartlaub 1917, p. 404. Bigelow 1918, p. 367: specimens from Bermudas, Strait of Florida and Bahama Bank confirm that *C. tetrastyla* is identical with *C. vulgaris* from Pacific Ocean. Pell 1918, pp. 22, 25: as *Cyteis tetrastyla*; Adriatic Sea. Uchida 1927*a*, p. 215, Pl. 10, fig. 7, text-fig. 39: as *C. japonica* n.sp. – *C. vulgaris* Maas 1909; Misaki, Japan. Kramp 1928, p. 45: comparison with *C. vulgaris*. Komai 1931, pp. 255–8, figs. A–C: hydroid of *C. japonica*; Misaki, Japan. Menon 1931, p. 502: as *C. vulgaris*; Madras. Menon 1932, p. 10, Pl. 1, fig. 3: Madras. Ranson 1932*a*, p. 994: Ile St Paul, Indian Ocean; map of distribution. Pell 1938, p. 923: Adriatic Sea. Thiel 1938*c*, pp. 297, 298: as *C. tetrastyla* and *atlantica*; S.W. of St Helena; W. of Acension; Cape Verde; Bay of Guinea; northern Brazil. Uchida 1938*a*, p. 145: Misaki–Kyushu, Japan. Uchida 1947*a*, p. 301: as *C. vulgaris*; Palao Islands, Pacific Ocean. Berrill 1950, p. 308, fig. 8, 1: as *C. atlantica*; budding. Nair 1951, p. 53: Trivandrum coast, India. Vannucci 1951*b*, pp. 106, 107, 112, 133: as *C. atlantica*; Brazil. George 1953, p. 82: Calicut, southern India. Kramp 1953, p. 263: *C. tetrastyla* = *C. nigritina* and *macrogaster*, *herdmani*, *japonica* and most of the Pacific and Malayan specimens previously referred to *C. vulgaris*. (The specific name *atlantica* Steenstrup 1837, employed by Mayer 1910, was never published by Steenstrup.) Kramp 1955*a*, p. 247: from Cape Verde to Angola; p. 308: identical with *C. nigritina* Haeckel from Cape Verde and Canary Islands. Kramp 1955*b*, pp. 153, 154: by Haeckel 1879 determined as *C. nigritina* n.sp. and *macrogaster*. Kramp 1957*a*, pp. 7, 125: tropical Atlantic. Vannucci 1957*d*, pp. 37, 51, 89, 99, 101, figs. 14, 15 (map and diagram): Brazil; discussion. Yamazi 1958, p. 135: as *C. japonica*; Tanabe Bay, Japan. Kramp 1959*a*, pp. 7, 99, 242, 249, 251, Pl. 1, figs. 3–6, text-fig. 62: warm parts of Atlantic Ocean (new records); asexual reproduction of polypoid structures; diagnosis; distribution.

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* See Addenda, p. 444.

Cytaeis vulgaris Agassiz & Mayer 1899

5 mm high, 3·5 mm wide. Stomach oval or spindle-shaped, 1/2–2/3 as long as bell cavity; short peduncle in young medusae. Four interradial, horseshoe-shaped gonads, with the concavity turned upwards. 32 oral tentacles. Tentacle bulbs large, no ectodermal swellings.

Agassiz & Mayer 1899, p. 161, Pl. 2, figs. 3–5: *Cytaeis vulgaris* n.sp.; Fiji Islands. Mayer 1910, p. 134. Hartlaub 1911, p. 139, fig. 130: *C. vulgaris* ? = *C. tetrastyla*. Vanhöffen 1911*a*, p. 204: *C. vulgaris* = *C. tetrastyla*. Browne 1916*a*, p. 177: *C. vulgaris* different from *C. tetrastyla*. Kramp 1928, p. 44, fig. 19: *C. vulgaris* different from *C. tetrastyla*. Kramp 1953, p. 263: *C. vulgaris* from Fiji Islands is probably a valid species; all other records are *C. tetrastyla*. Kramp 1959*a*, p. 99: doubtful synonym of *C. tetrastyla*.

Family *CLAVIDAE*

Anthomedusae with mouth with four lips with continuous row of nematocyst clusters along margin; with interradial gonads; with four simple radial canals; with numerous solid marginal tentacles; with adaxial ocelli. Hydroids *Clava*-like.

Genus ***Oceania*** Kölliker 1853

Clavidae with eight or more marginal tentacles not grouped in clusters. Manubrium upon a simple, solid, gelatinous peduncle (not vacuolated).

Type-species: *O. armata* Kölliker.

Péron & Lesueur 1809, pp. 344–7: *Oceania* n.g. in part. Kölliker 1853, p. 323: *Oceania* n.g. in new sense. Mayer 1910, p. 146: historical review.

Oceania armata Kölliker 1853.

8–10 mm high and wide; pyriform, flat-topped, with uniform, thin walls. Stomach flask-shaped, cruciform in cross-section, upon a short, pyramidal peduncle. 60–100 marginal tentacles, crowded.

Kölliker 1853, p. 323: *Oceania armata* n.sp.; Mediterranean. Mayer 1910, p. 147, figs. 79–81: *O. armata* = *O. flavidula* Gegenb. 1856, *Turritopsis armata* Hckl. 1879, *Callitiara polyophthalma* Hckl. 1879, *Tiarella parthenopia* Trinci 1906. Hartlaub 1911, p. 202: agrees with Mayer. Grobben 1915, p. 5: Adriatic Sea. Neppi 1915, p. 5: Adriatic Sea. Pell 1918, pp. 22, 23, 25: Adriatic Sea. Kramp 1920*a*, p. 6: S.W. of Azores. Kramp 1924, p. 4: Mediterranean. Ranson 1925*b*, p. 380: S.W. of Portugal. Slonimski 1926, p. 926: Villefranche-sur-Mer, Mediterranean. Uchida 1927*a*, p. 219: Misaki, Japan. Ranson 1932*a*, p. 995: Villefranche-sur-Mer, Mediterranean. Thiel 1935*c*, p. 165: *O. armata*? Black Sea. Ranson 1936*b*, p. 57: Canary Islands. Pell 1938, p. 923: Adriatic Sea. Babnik 1948, p. 18: Adriatic Sea. Kramp 1948*b*, p. 20: Bay of Cadiz, Spain. Hure 1955, p. 6: Adriatic Sea. Kramp 1955*a*, p. 307: = *Callitiara polyophthalma* Haeckel from Canary Islands. Kramp 1955*b*, p. 152: by Haeckel determined as *Conis cyclophthalma.* Kramp 1959*a*, pp. 8, 99, 222, 223, 225, 232, 233, 270, fig. 63: Canary Islands; diagnosis; distribution. Kramp 1959*b*, p. 5: Senegambia, W. Africa; West Indies.

Genus ***Turritopsis*** McCrady 1856

Clavidae with eight or more simple marginal tentacles, not in clusters. The walls of the four radial canals, above stomach, consist of highly vacuolated endodermal cells forming a peduncle for the stomach.

Type-species: *T. nutricula* McCrady.

McCrady 1856, p. 55: *Turritopsis* n.g. Mayer 1910, p. 143: *Turritopsis*, belongs to Margelinae, subfamily of Oceanidae. Hartlaub 1911, p. 201: belongs to family Margelidae. Kramp 1935, p. 11: hydroid of *Turritopsis* is referred to *Corydendrium.* Russell 1953, p. 114: belongs to family Clavidae.

Turritopsis lata von Lendenfeld 1884

3·5 mm high, 3 mm wide; with a low, dome-like, apical projection. Manubrium on a gelatinous peduncle; proximal parts of radial canals vacuolated; stomach spindle-shaped, 2/3 as long as bell cavity; four recurved lips with stalked nematocyst warts. 60–130 marginal tentacles.

von Lendenfeld 1884*a*, p. 588, Pl. 22, figs. 36, 36*a*: *Turritopsis lata* n.sp.; New South Wales, Australia. Mayer 1910, p. 146: as *T.*(?) *lata.* Kramp 1953, p. 310: type-specimen examined; distinct species of *Turritopsis.*

Turritopsis nutricula McCrady 1856

4–5 mm high and wide, bell-shaped, walls uniformly thin. Stomach large, cross-shaped in transverse section. 80–90 marginal tentacles.

McCrady 1856, pp. 55–90, Pl. 4, figs. 1–10: as *Oceania* (*Turritopsis*) *nutricula* n.sp. Mayer 1910, p. 143, Pl. 14, figs. 10–13, Pl. 15, figs. 10–13, text-figs. 77–9: as *T. nutricula*, incl. *polycirrha*; Cuba to southern New England; (N.W. Europe); p. 722: as *T. pacifica* Maas 1909, regarded to be a valid species. Hartlaub 1911, p. 202, figs. 179–84: *T. polycirrha* = *T. nutricula*?; North Sea, new record; (N.W. Europe; Mediterranean; Bahamas; from Cuba to New England); p. 210: *T. pacifica* is a valid species; (Japan). Neppi & Stiasny 1911, p. 398: Trieste. Vanhöffen 1911*a*, p. 209: as *Turritopsis* sp.; between Chagos Islands and Seychelles, Indian Ocean. Bigelow 1913, p. 8: comparison with *T. pacifica*; Kagoshima Gulf, Japan. Neppi & Stiasny 1913*b*, p. 47: Trieste. Vanhöffen 1913*a*, p. 418: Tortugas, Florida. Bigelow 1914*b*, p. 8: New England. Browne 1916*a*, p. 179: Chagos Archipelago, Indian Ocean; discussion; *T. pacifica* is a valid species; *T. polycirrha* = *Turris neglecta* Lesson, non = *T. nutricula*; p. 180: *T. nutricula* = *Modeeria multitentaculata* Fewkes 1881. Hartlaub 1917, p. 407: maintains that *T. nutricula* is different from *T. polycirrha*. Ranson 1925*c*, p. 460, fig.: St Waast, French Channel coast. Uchida 1925*b*, p. 84, figs. 8, 9: Japan. Browne 1926, p. 106: as *T. pacifica*; Suez Canal. Fish 1926, p. 123: Woods Hole. Uchida 1927*a*, p. 217: *T. nutricula*, incl. *pacifica*; Japan. Uchida 1927*b*, p. 219: *T. pacifica* = *nutricula*; Asamushi, Japan. Kramp 1928, p. 53: as *T. pacifica*, different from *T. nutricula*; Bare Island, New Zealand; p. 54: *T. polycirrha* = *nutricula*. Kramp 1930, p. 13: S.W. North Sea and Strait of Dover. Uchida 1930, p. 331: states that *T. pacifica* Maas = *nutricula*, after an examination of original specimens. Tu 1931, p. 87: as *Turritopsis* sp.; Tsingtao, Chefoo, China. Wulff, Bückmann & Künne 1934, pp. 333, 336: as *T. polycirrha*. Kramp 1935, p. 11: hydroid of *T. nutricula* is referred to *Corydendrium*. Kramp 1937*b*, p. 56, fig. 23: as *T. polycirrha*. Künne 1937*a*, pp. 142, 147, 151–62: North Sea. Ling 1937, p. 354, figs. 3, 4: Chekiang coast, China. Russell 1938*b*, pp. 412–20, 423, 436: Plymouth. Uchida 1938*b*, p. 40: Japan. Uchida 1938*c*, p. 50: Japan. Russell 1939*a*, pp. 175, 179: North Sea. Russell 1940*a*, p. 515: nematocysts. Uchida 1940*a*, p. 287: Japan. Uchida 1947*a*, p. 301: central Pacific Ocean. Ranson 1949, p. 124: Senegal. Franc 1951, p. 27: St Malo, French Channel coast. Russell 1953, p. 115, Pl. 5, figs. 1–5, Pl. 29, figs. 1–3, text-figs. 54A–C, 55, 56: *T. nutricula*, incl. *polycirrha*; British coasts. Chiu 1954*b*, pp. 49, 52: China. Kramp 1955*a*, p. 248: off Sierra Leone; Gulf of Guinea, W. Africa. Maghraby & Perkins 1956, p. 486: Whitstable, mouth of Thames. Vannucci 1957*d*, pp. 37, 47, 88, 96, 97, 99, 101, 102, figs. 12, 13 (map and diagram): Brazil. Chow & Huang 1958, pp. 176: Chefoo, China. Ganapati & Nagabhushanam 1958, pp. 92, 94: as *Turritopsis* sp.; Vizagapatam coast, India. Yamazi 1958, p. 136: Tanabe Bay, Japan. Kramp 1959*a*, pp. 9, 100, 211, 214, 215, 218, 223, 227, 231, 242, 243, 245, 246, 247, 251, 270, fig. 64: West Africa; central tropical Atlantic (new records); diagnosis; distribution.

Family *HYDRACTINIIDAE*

Anthomedusae with mouth with four simple or branching lips armed with terminal clusters of nematocysts; with four radial canals; with gonads either only on interradial walls of stomach, or on proximal portions of radial canals as well; with four, eight or more solid marginal tentacles; with or without ocelli. Hydroids *Hydractinia*-like.

Genus **Podocoryne** M. Sars 1846

Hydractiniidae with four or more simple marginal tentacles, not in groups; with four or eight simple or slightly branched mouth-arms which are dilatations of the mouth-rim; with or without ocelli.

Type-species: *P. carnea* Sars.

M. Sars 1846, p. 4, Pl. 1, figs. 7–18: *Podocoryna* n.g., hydroid. A. Agassiz 1865, p. 163: as *Dysmorphosa*; free medusa. Mayer 1910, p. 135: *Podocoryne* for both hydroid and medusa. Hartlaub 1911, p. 210: *Podocoryne*: ' Margelidae ' in which mouth-arms are dilatations of the mouth-rim. Russell 1953, p. 120: belongs to the new family Hydractiniidae.

Podocoryne apicata Kramp 1959

Up to 1·2 mm high, somewhat higher than wide, dome-shaped or slightly conical, with a bluntly conical apical projection. Stomach barrel-shaped, on a distinct gelatinous peduncle of varying length, with four interradial gonads completely covering the stomach in its entire length; the stomach with its peduncle about half as long as the bell cavity; mouth narrow, with four small, simple mouth-arms, each terminating in a small cluster of nematocysts. Four long tentacles with fairly large basal bulbs; each tentacle with a large, circular patch of orange-red pigment on its abaxial side.

Kramp 1959*c*, p. 228, fig. 5: *Podocoryne apicata* n.sp.; Malacca; Gulf of Siam.

Podocoryne borealis (Mayer 1900)

Up to 5 mm high and wide. Stomach long and tubular; four mouth-arms, in later stages bifurcated once or twice, each branch with a nematocyst knob. No peduncle; gonads interradial, occupying greater part of stomach; no medusa-buds. 16–32 marginal tentacles, no ocelli.

Mayer 1900*a*, p. 6, Pl. 5, figs. 16–18: as *Lymnorea borealis* n.sp.; Eastport, Maine, U.S.A. Mayer 1910, p. 140: the medusa recorded by Browne 1895, 1897, 1903 from British and Norwegian coasts as *Cytaeandra areolata* may prove to be *P. borealis*; p. 154, Pl. 15, figs. 1–3: as *L. borealis.* Hartlaub 1911, p. 219, figs. 192–4: as *P. areolata*; N.W. Europe; p. 225, fig. 195: *P. borealis*; p. 227: as *L. norwegica.* Bigelow 1914*b*, p. 7: as *L. borealis.* Int. Plankt. Catal. III 1916, p. 42: as *C. areolata*; Ireland. Bigelow 1917, p. 303: as *L. borealis*; Gulf of Maine, U.S.A. Dick 1919, p. 91: as *P. areolata*; Firth of Clyde. Peacock 1924, p. 58: as *L. borealis*; Cullercoats, England. Kramp & Damas 1925, p. 268, figs. 15–17: *P. areolata* = *Limnorea norwegica* Broch; Norway. Kramp 1927, p. 76: as *P. areolata*; west coast of Jutland. Kramp 1930, p. 15: as *P. areolata*; Zeebrugge, Ostende, Belgium. Sanderson 1930, p. 224: Northumberland coast. Watson 1930, p. 234: Northumberland coast. Mar. Biol. Ass. 1931, p. 80: as *P. areolata*; Plymouth. Runnström 1932, p. 28: as *P. areolata*; Herdla- and Hjeltefjord, Norway. Kramp 1937*b*, p. 53, fig. 21: as *P. areolata*; Denmark. Moore 1937, p. 48: as *P. areolata*; Port Erin, Isle of Man. Russell, 1938*b*, pp. 413, 416, 417: as *P. areolata*; Plymouth.

KRAMP 1939*a*, p. 7: as *P. areolata*; Iceland. RUSSELL 1940*b*, p. 525: the hydroid *P. areolata* possibly belongs to *P. hartlaubi*. REES 1941*b*, pp. 307–16, fig. 1*a–f*: *P. borealis*, has been confounded with *P. areolata*; list of synonyms; description of hydroid; Millport, Scotland. KRAMP 1947, p. 50: specimens from Denmark and Norway re-examined and referred to *P. borealis*; Bergen, Norway. KÜNNE 1952, pp. 10, 32, 34, 39: as *P. areolata*; S.E. North Sea. RUSSELL 1953, p. 125, Pl. 6, fig. 5, text-figs. 57B, 59A, C–F: British coasts. SOUTHWARD 1954, p. 18: Irish Sea. VANNUCCI 1956*b*, p. 245: Clyde Sea, Scotland. KRAMP 1959*a*, pp. 101, 211, 215, 216, 219, 220, fig. 67: diagnosis; distribution. WERNER 1959*a*, p. 33: Port Erin, Isle of Man.

Podocoryne carnea M. Sars 1846

Size varying, 1–3·5 mm, in different localities. Manubrium flask-shaped; no peduncle; four short, unbranched mouth-arms, each with one cluster of nematocysts; gonads interradial; no medusa-buds. 4–8 marginal tentacles without ocelli, in the Mediterranean sometimes up to 16 tentacles.

M. SARS 1846, p. 4, Pl. 1, figs. 7–18: *Podocoryna carnea* n.g., n.sp.; Norway. MAYER 1910, pp. 136, 492, Pl. 14, figs. 2–6, Pl. 15, fig. 14, text-fig. 74: (Atlantic coasts of Europe; Mediterranean; South Africa; W. coast of Greenland); New England; North Carolina. HADŽI 1911*c*, p. 176, text-figs. 19–22: *Podocoryne*; Adriatic Sea. HARTLAUB 1911, p. 213, figs. 189, 190: (American and European localities). NEPPI & STIASNY 1913*b*, p. 44, Pl. 1, fig. 11: as *Cytaeis exigua*; Trieste. BIGELOW 1914*b*, p. 7: New England. PELL 1918, pp. 22, 25: as *C. exigua*; Adriatic Sea. DICK 1919, p. 91: Firth of Clyde. NEPPI 1919, p. 120: as *Hydractinia carnea* var. *mediterranea*; abnormal specimen; Naples. MARSHALL 1925, p. 127: Clyde. FISH 1926, p. 123: Woods Hole. KRAMP 1927, p. 72: Denmark. MAR. BIOL. ASS. 1931, p. 80: Plymouth. RUNNSTRÖM 1932, p. 28: Herdla- and Hjeltefjord, Norway. THIEL 1932*a*, p. 133. THIEL 1932*b*, pp. 440 ff.: distribution. HOVASSE 1935, pp. 59–85: parasitism by the peridinian *Protoodinium chattoni*. KRAMP 1937*b*, p. 52, fig. 20: Denmark. PELL 1938, p. 923: as *C. exigua*; Adriatic Sea. RUSSELL 1938*b*, pp. 413, 416, 417: Plymouth. KRAMP 1939*a*, p. 7: hydroid; Iceland. STANTSCHEW 1940, pp. 11–18, Pl. 1, figs. 1–4: Varna, Black Sea. BABNIK 1948, p. 15: as *Cytaeis exigua*; Adriatic Sea. BERRILL 1950, p. 308, fig. 8C: hydroid. DEEVEY 1952*b*, pp. 150, 151: Block Island Sound, east coast of U.S.A. KRAMP 1952, p. 4, figs, 1, 2: *P. carnea* var. *chilensis* n.var.; Chile. REES 1953*a*, p. 8: Herdlafjord, Norway. RUSSELL 1953, p. 121, Pl. 6, figs. 2, 3, text-figs. 57A, 58A, B, 59B: British coasts. SOUTHWARD 1954, p. 18: Irish Sea. MAGHRABY & PERKINS 1956, p. 486: mouth of Thames. NAUMOV 1956*a*, pp. 558–561, fig. 2 v. VANNUCCI 1956*b*, p. 249: Clyde Sea, Scotland. VALKANOV 1957, p. 17: Black Sea. KRAMP 1959*a*, pp. 101, 211, 215, 216, 220, 221, 223, 227, 230, 271, fig. 65: diagnosis; distribution.

Podocoryne dubia (Mayer 1900) Mayer 1910

1·5 mm high and wide. Manubrium pear-shaped, half as long as bell cavity; no peduncle; four short, undivided mouth-arms; gonads? A small swelling in the middle of each radial canal. No medusa-buds. Eight marginal tentacles with a large, black adaxial ocellus. Doubtful species.

MAYER 1900*b*, p. 40, Pl. 22, figs. 64–6: as *Dysmorphosa dubia* n.sp.; Tortugas, Florida. MAYER 1910, p. 141, Pl. 14, figs. 7–9: *Podocoryne dubia*. HARTLAUB 1911, p. 211: *P. dubia* doubtful species. KRAMP 1959*a*, pp. 102, 231, fig. 71: diagnosis; distribution.

Podocoryne hartlaubi Neppi & Stiasny 1911

3·5 mm high and wide. Stomach cylindrical, about half as long as bell cavity, with very slightly indicated peduncle; four simple mouth-arms, each with one knob of nematocysts; gonads interradial on stomach with short extensions along the radial canals; no medusa-buds. Up to 57 marginal tentacles of unequal sizes, eight large, the others small, with swollen bulbs; no ocelli.

NEPPI & STIASNY 1911, p. 395: *Podocoryne hartlaubi* n.sp.; Trieste. NEPPI & STIASNY 1913*b*, p. 47, Pl. 2, fig. 14: Trieste. RUSSELL 1940*b*, p. 525, fig. 1*a*–*d*: *P. areolata* (Alder) is possibly the hydroid of *P. hartlaubi*; Valentia, Ireland; mouth of English Channel. RUSSELL 1953, p. 130, Pl. 6, figs. 1, 4, text-figs. 60A–D, 61A, B: British coasts. KRAMP 1958*a*, pp. 117, 127: Villefranche, Mediterranean. KRAMP 1959*a*, pp. 101, 215, 216, 223, fig. 66: diagnosis; distribution.

Podocoryne meteoris Thiel 1938

1–1·5 mm high, 1·5–2 mm wide; cubical. 12 oral tentacles. Medusa-buds on stomach; no stomachal peduncle. Eight equal marginal tentacles; ocelli present?

THIEL 1938*c*, p. 298, fig. 3: *Podocoryne meteoris* n.sp.; Cape Verde Islands. KRAMP 1955*a*, p. 310: the species provisionally retained. KRAMP 1959*a*, p. 103, fig. 72: diagnosis.

Podocoryne minima (Trinci 1903)

0·3–1 mm high. Medusa-buds on the stomach; stomach short, on short peduncle; four simple mouth-arms. Four marginal tentacles.

TRINCI 1903, p. 1, Pl. 1, figs. 1–30: as *Cytaeis minima* n.sp.; Naples. MAYER 1910, p. 140: *Cytaeis minima*—*Podocoryne minuta*? HARTLAUB 1911, pp. 212, 219, 221, 234. KRAMP 1928, p. 47: *Podocoryne minima*. RUSSELL 1940*b*, p. 528: identical with *P. simplex*?; Plymouth. RUSSELL 1953, p. 134, text-figs. 63, 64: identical with *P. minuta* Mayer and *P. simplex* Kramp?; Plymouth. VANNUCCI 1957*d*, pp. 37, 49, 89, 97, 98, 99, 102: Brazil; discussion, probably not = *P. minuta*. CHOW & HUANG 1958, pp. 176, 189, Pl. 1, figs. 10, 11: Chefoo, China. KRAMP 1959*a*, pp. 102, 215, 216, 223, fig. 69: diagnosis; distribution.

Podocoryne minuta (Mayer 1900)

0·3 mm high, pear-shaped, with thick, solid apex. Stomach on a short peduncle; four well developed, simple mouth-arms; several medusa-buds on sides of stomach. Eight marginal tentacles, no ocelli.

MAYER 1900*b*, p. 41, Pl. 18, fig. 42: as *Dismorphosa minuta* n.sp.; Tortugas, Florida. MAYER 1910, p. 140, Pl. 14, fig. 1: *Podocoryne minuta*. ?NEPPI & STIASNY 1911, p. 399: Trieste. ?NEPPI 1912, p. 721: Dalmatia, Adriatic Sea. ?NEPPI & STIASNY 1913*b*, p. 46, Pl. 1, fig. 12, Pl. 2, figs. 13*a*, *b*: Trieste. HARTLAUB 1917, p. 405. KRAMP 1928, p. 47. THIEL 1938*c*, p. 298: Great Fishbay, W. Africa. ?BABNIK 1948, p. 19: Adriatic Sea; pp. 70, 71: biological remarks. BERRILL 1950, p. 308: budding. RUSSELL 1953, p. 134: identical with *P. minima*? KRAMP 1955*a*, p. 310. VANNUCCI 1957*d*, p. 50: probably not = *P. minima*. KRAMP 1959*a*, pp. 102, 224, 227, 231, fig. 68: diagnosis; distribution.

Podocoryne ocellata (A. Agassiz & Mayer 1902)

4 mm high and wide; bell-shaped with flat top, walls thin. Manubrium half as long as bell cavity; oral arms divided four times; four interradial gonads. About 50 short, stiff tentacles, each with a prominent, adaxial ocellus.

A. Agassiz & Mayer 1902, p. 144, Pl. 2, figs. 9–12: as *Lymnorea ocellata* n.sp.; Paumotus, South Pacific Ocean. Mayer 1910, p. 153, fig. 83: as *L. ocellata*.

Podocoryne polystyla (Haeckel 1879) Mayer 1910

1·5 mm high and wide. Stomach large, cubical, on short peduncle; 16 simple mouth-arms; gonads half-moon-shaped, convex side below. 32 marginal tentacles. Doubtful species.

Haeckel 1879, p. 79: as *Cytaeandra polystyla* n.sp.; Croisic, France. Mayer 1910, p. 140: *Podocoryne polystyla*. Hartlaub 1911, p. 224. Kramp 1959*a*, p. 103: doubtful species.

Podocoryne simplex Kramp 1928

0·75 mm high and wide, dome-shaped, walls thin. Stomach on short peduncle, barrel-shaped, circular in cross-section; gonads interradial, surrounding stomach in its whole length; four simple mouth-arms; medusa-buds on stomach. Four marginal tentacles, two larger, two smaller.

Kramp 1928, p. 45, fig. 20: *Podocoryne simplex* n.sp.; Misaki, Japan. Uchida 1930, p. 331: new localities, Japan. Uchida 1938*a*, p. 145: along coasts of Honshu, Japan. Uchida 1938*b*, p. 39: Mutsu Bay, Japan. Uchida 1947*a*, p. 301, fig. 3 Palao Islands, Pacific. Russell 1953, p. 134: *P. simplex* = *P. minima*? Yamazi 1958, p. 135: Tanabe Bay, Japan.

Podocoryne tenuis (Browne 1902)

2 mm high, 1·5 mm wide; somewhat conical with a slight constriction below thickened apex. Stomach cubical, on a well developed peduncle of about the same length; mouth with four short lips each with a cluster of nematocysts, but not prolonged as mouth-arms; medusa-buds on interradial sides of stomach. Eight marginal tentacles of equal size, no ocelli.

Browne 1902, p. 277: as *Dysmorphosa tenuis* n.sp.; Falkland Islands. Mayer 1910, p. 141: *Podocoryne tenuis*. Kramp 1928, p. 47. Browne & Kramp 1939, p. 280, Pl. 15, figs. 5, 6: new description; Falkland Islands. Kramp 1959*a*, pp. 102, 235, fig. 70: diagnosis; distribution.

Podocoryne tournieri (Picard & Rahm 1954) *

Umbrella subconical with thick apex, no gastric peduncle. Stomach very extensible, but hardly reaching beyond velum; mouth with four faintly developed lips, each with a cluster of nematocysts, but without oral tentacles; stomach with medusa-buds, gonads not developed. Four radial canals. Tentacle bulbs large, each with a carmine adaxial ocellus; four tentacles, solid, with small nematocyst clusters spirally arranged.

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* See Addenda, p. 444.

(Similar to *P. tenuis*, but without gastric peduncle and with only four tentacles.)

PICARD & RAHM 1954, pp. 303–7, figs. 1, 2: as *Archaeoceania tournieri* n.g., n.sp.; Ivory Coast, W. Africa.

Genus ***Stylactis*** Allman 1864

Degenerate medusae, with 4–8 rudimentary tentacle bulbs, four simple radial canals and a ring canal; manubrium sac-like without a mouth and without oral tentacles. Gonad encircling stomach.

Type-species: *S. fuciola* (M. Sars 1857). Hydroid.

M. SARS 1857, p. 145, Pl. 2, figs. 6–13: *Podocoryne fuciola* n.sp.; hydroid without free medusae. ALLMAN 1864, p. 353: *Stylactis* n.g. SIGERFOOS 1889, p. 801: *S. hooperi*, hydroid and newly liberated medusa. MAYER 1910, p. 149: *Stylactis*.

Stylactis hooperi Sigerfoos 1889

Globular. Manubrium wide, fills greater part of bell cavity. Eight rudimentary tentacle bulbs.

SIGERFOOS 1889, p. 801, 5 figs.: *Stylactis hooperi* n.sp.; east coast of U.S.A. MAYER 1910, p. 150, fig. 82. BIGELOW 1914*b*, p. 8: Woods Hole. NAUMOV 1956*a*, pp. 558–61, fig. 2*g*. KRAMP 1959*a*, p. 103, fig. 73: diagnosis.

Stylactis pruvoti (Motz-Kossowska 1905)

1 mm high, 0·6–0·7 mm wide; well developed gastric peduncle. Manubrium elongated oval, with ring-shaped gonad; mouth closed. Four rudimentary tentacles.

MOTZ-KOSSOWSKA 1905, pp. 89–91: as *Hydractinia pruvoti* n.sp. BEHNER 1914, p. 415, figs. 14–18: *Stylactis pruvoti*, medusa to *Hydractinia pruvoti*; Naples. KRAMP 1959*a*, pp. 103, 223, 226, fig. 74: diagnosis; distribution.

Family *RATHKEIDAE*

Anthomedusae with mouth with four lips elongated to form oral arms armed with terminal, usually also lateral, clusters of nematocysts; with or without medusa-buds on stomach walls; with four (rarely eight) radial canals; with solid marginal tentacles arranged in eight groups; without ocelli. Hydroid *Rathkea*, with single whorl of very extensile filiform tentacles.

Genus ***Octorathkea*** Uchida 1927

Rathkeidae with eight radial canals and eight marginal clusters of tentacles. Manubrium four-sided with four lips, no oral tentacles. Abnormal specimen?

Type-species: *O. onoi* Uchida.

Octorathkea onoi Uchida 1927

1·5 mm high and wide. No oral tentacles. Gonads not developed. Five tentacles in each perradius, three in each interradius. Ocelli?

UCHIDA 1927*a*, p. 226, fig. 42: *Octorathkea onoi* n.g., n.sp.; Takashima, Japan.

Genus ***Rathkea*** Brandt 1838

Rathkeidae with four radial canals; with marginal tentacles arranged in eight groups (four perradial and four interradial); the four corners of the mouth drawn out so as to form four oral arms with clusters of nematocysts.

Type-species: *R. octopunctata* (M. Sars).

BRANDT 1838, p. 187: *Rathkea* n.g. MAYER 1910, p. 175: *Rathkea* = *Lizzia* Forbes 1846, *Margellium* Haeckel 1879; p. 179: incl. *Köllikeria* L. Agassiz 1862. HARTLAUB 1911, p. 228: *Rathkea* = *Lizzia* Forbes 1846, 1848 in part. BROWNE & KRAMP 1939, p. 281: diagnosis. RUSSELL 1953, p. 137: belongs to the new family Rathkeidae.

Rathkea africana Kramp 1957

1·7 mm high, 1·2 mm wide. No apical projection; no gastric peduncle. Gonads adradial; medusa-buds on stomach; oral lips bifurcated, each with two broad, terminal clusters of nematocysts, no lateral clusters. Perradial marginal bulbs with 3–4 tentacles, interradial with 2–3; no dark pigmentation in the marginal bulbs.

KRAMP 1957*a*, pp. 8, 96, Pl. 1, fig. 5: *Rathkea africana* n.sp.; Gulf of Guinea, W. Africa. KRAMP 1959*a*, pp. 104, 227, fig. 77: diagnosis; distribution.

Rathkea formosissima (Browne 1902)

3 mm high, 2·5 mm wide, bell-shaped, with a large, dome-shaped, gelatinous apex. Stomach small, about as long as broad, on a well developed peduncle; mouth quadrangular, with four oral arms, each with 7–11 clusters of nematocysts in a double row; gonads four interradial masses; medusa-buds may be present. Marginal tentacles five in each perradial, three in each interradial group.

BROWNE 1902, p. 278: as *Lizzia formosissima* n.sp.; Falkland Islands. MAYER 1910, p. 177: *Rathkea formosissima*. HARTLAUB 1911, p. 144: as *L. formosissima*. BROWNE & KRAMP 1939, p. 281, Pl. 14, fig. 5, Pl. 19, fig. 1: new description; Falkland Islands. VANNUCCI 1951*b*, p. 106. KRAMP 1957*a*, p. 8: comparison with *R. africana*. KRAMP 1959*a*, pp. 104, 235, fig. 76: diagnosis; distribution.

Rathkea octopunctata (M. Sars 1835)

3–4 mm high, 2–4·5 mm wide; pyriform with solid apical projection. Stomach short, four-sided, on a well developed peduncle; medusa-buds on the stomach; mouth with four lips with 1–2 pairs of nematocyst knobs. 3–5 marginal tentacles in each perradial, three in each interradial group.

M. Sars 1835, p. 28, Pl. 6, figs. 14*a–g*: as *Cytaeis* (?) *octopunctata* n.sp.; Norway. Kishinouye 1910, p. 25, Pl. 5, fig. 24: as *Lizzia shimiko* n.sp.; Japan. Mayer 1910, pp. 177, 722, Pl. 20, fig. 11: *Rathkea octopunctata* (Arctic Ocean; N. Atlantic coasts of Europe and America; Black Sea); p. 179: as *R. octopunctata* var. *grata* (Rhode Island, U.S.A.). ?Hadži 1911*c*, p. 192, text-fig. 39: as *Hippocrene*; Adriatic Sea. Hartlaub 1911, p. 229, figs. 196–9: *R. blumenbachii* (Rathke 1835) *R. octopunctata* (all localities). Neppi & Stiasny 1911, p. 399: Trieste. Bigelow 1913, p. 11: as *R. blumenbachii*; Dutch Harbour, N.W. America. Kramp 1913*a*, p. 266: W. Greenland. Kramp 1913*b*, p. 523: Skagerak; British waters; Barents Sea. Neppi & Stiasny 1913*b*, p. 56, Pl. 2, fig. 23: as *R. blumenbachii*; Trieste. Bigelow 1914*b*, p. 9: as *R. blumenbachii*; New England. Bigelow 1914*d*, p. 407: as *R. blumenbachii*; Massachusetts, U.S.A. Kramp 1914, p. 408: W. Greenland. Kramp 1915, p. 10: Great Belt and Kattegat, Denmark. Int. Plankt. Catal. III 1916, p. 42: England; Ireland; Holland; Denmark; Sweden. Hartlaub 1917, p. 408: retains the name *blumenbachii* opposite Kramp 1914. Lebour 1917, p. 161: Plymouth. Dick 1919, p. 91: as *R. blumenbachii*; Firth of Clyde. Bigelow 1920, p. 6: as *R. blumenbachii*; Alaska. Sverdrup 1921, p. 21, Pl. 2, fig. 8: Kristianiafjord, Norway. Lebour 1922, p. 662: food. Foerster 1923, p. 247: as *R. blumenbachii*; Dutch Harbour, Bering Sea; Vancouver. Lebour 1923, p. 81, fig. 6*a–d*: food. Kramp & Damas 1925, p. 271: Norway. Marshall 1925, p. 127: as *R. blumenbachii*; Clyde. Ranson 1925*c*, p. 461, fig. : Wimereux, English Channel. Uchida 1925*a*, p. 112: *Lizzia shimiko* Kishin. = *R. octopunctata*; Japan. Uchida 1925*b*, p. 86: as *R. blumenbachii*; Japan. Bigelow 1926, p. 43: as *R. blumenbachii*; Gulf of Maine. Fish 1926, pp. 123, 124: as *L. grata*; Woods Hole. Kramp 1926*a*, p. 58: discussion of specific name; Greenland; Iceland; Faroes; Plymouth. Kramp 1927, p. 76: Denmark. Uchida 1927*a*, p. 224: Japan. Uchida 1927*b*, p. 219: as *R. blumenbachii*; Asamushi, Japan. Kramp 1930, p. 15: Boulogne; Dover Strait; Belgium. Sanderson 1930, p. 225: Northumberland coast. Uchida 1930, p. 334: Asamushi, Japan. Watson 1930, p. 234: Northumberland coast. Mar. Biol. Ass. 1931, p. 81: Plymouth. Runnström 1932, p. 27: Herdla- and Hjeltefjord, Norway. Thiel 1932*a*, p. 134: remarks about the name. Thiel 1932*b*, p. 440 ff.: distribution. Russell 1933, p. 74. Uchida 1933*a*, p. 130: S.W. Kamchatka. Bernstein 1934, pp. 9, 24: Kara Sea. Künne 1935, p. 63: Baltic Sea. Kramp 1937*b*, p. 55, fig. 22: Denmark. Künne 1937*b*, p. 6: Baltic Sea. Moore 1937, p. 49: Port Erin, Isle of Man. Rees & Russell 1937, p. 71, figs. 7, 8: rearing of hydroid; Plymouth. Russell 1938*b*, pp. 413, 416, 418: Plymouth. Russell 1938*d*, p. 153, figs. 26–32: nematocysts. Uchida 1938*b*, p. 40: Japan. Yashnov 1939, pp. 112, 113: Chukotski Sea; Laptev Sea; Kara Sea. Kramp 1939*a*, p. 7: Iceland. Littleford 1939*b*, p. 1070: as *R. blumenbachii, octopunctata, octop.* var. *grata, elegans*; east coast of N. America. Uchida 1940*a*, p. 288: Japan. Dunbar 1942, p. 73: Hudson Strait. Kramp 1942, p. 32: W. Greenland. Yashnov 1948, p. 70, Pl. 19, fig. 3: north of U.S.S.R.; Sea of Okhotsk. Berrill 1950, p. 308, fig. 8G, H: budding. Kändler 1950, p. 67: Fehmarnbelt, Baltic Sea. Berrill 1952, p. 1, figs.: sexual and asexual reproduction. Deevey 1952*b*, pp. 150, 151: Block Island Sound, east coast of U.S.A. Künne 1952, pp. 9, 30, 32, 38: S.E. North Sea. Russell 1953, p. 137, Pl. 7, figs. 3, 4, text-figs. 65–9E, 66, 67A, B: British waters. List of synonyms. Historical review. Chiu 1954*b*, p. 56. Lubet 1954, p. 213: as *Rathkea*; Arcachon, France. Southward

1954, p. 18: Irish Sea. Mac Ginitie 1955, pp. 41, 107, 118: breeding season; Point Barrow, Alaska. Naumov 1956*b*, p. 37. Maghraby & Perkins 1956, p. 486: Thames estuary. Vannucci 1956*b*, pp. 245, 248: Clyde Sea, Scotland. Werner 1956*a*, pp. 159–77, figs. 1–5: physiological experiments on metagenesis. Kramp 1957*a*, p. 8: comparison with *R. africana*. Kulikova 1957, p. 899, fig. 1: hermaphroditism in the gonad. Valkanov 1957, p. 17: Black Sea. Aurich 1958, p. 215: frequency of occurrence in S.E. North Sea. Chow & Huang 1958, pp. 176, 189, Pl. 1, fig. 21: Chefoo, China. Werner 1958, pp. 137–70, text-figs. 1–13: distribution, seasonal occurrence and development; North Sea. Yamazi 1958, p. 136: Tanabe Bay, Japan. Kramp 1959*a*, pp. 103, 208–11, 215, 220, 221, 223, 231, 232, 269, fig. 75: diagnosis; distribution. Werner 1959*a*, p. 33: Port Erin, Isle of Man.

Rathkea rubence Nair 1951

1·5 mm high, 1 mm wide, top flatly rounded. Perradial corners of mouth swollen lobes with nematocysts; mouth pistils absent; no medusa-buds. 3–4 tentacles in each group, with ocelli.

Nair 1951, p. 54, Pl. 1, figs. 2, 3: *Rathkea rubence* n.sp.; Trivandrum coast, India. Kramp 1957*a*, p. 8: comparison with *R. africana*.

Family *BOUGAINVILLIIDAE*

Anthomedusae with simple tubular mouth with simple or dichotomously branching oral tentacles inserted above the mouth opening; with four radial canals; gonads interradial or adradial, or completely surrounding stomach; with two, four or more solitary marginal tentacles, or with four, eight or sixteen large marginal bulbs each with a group of solid tentacles; with or without ocelli. Hydroids with a single whorl of filiform tentacles.

Genus **Bougainvillia** Lesson 1836

Bougainvilliidae with four radially placed clusters of marginal tentacles, the tentacles of each cluster being all of one kind and similar in structure. With four perradial, dichotomously branching oral tentacles; gonads interradial or adradial.

Type-species: *B. macloviana* Lesson.

Lesson 1836, p. 262: *Bougainvillia* n.g. Mayer 1910, p. 155: *Bougainvillia* (=*Hippocrene* Brandt 1835 (preoccupied for Mollusca) and *Margelis* Steenstrup 1850). Hartlaub 1911, p. 152. Kramp 1926*a*, p. 41. Russell 1953, p. 152.

Bougainvillia alderi (Hodge 1863)

Hodge 1863, pp. 82–87, Pl. 2, figs. 10–15: *Podocoryne alderi* n.sp., hydroid and young medusa; Durham, England. Hartlaub 1911, p. 182, fig. 161: doubtful species.

Bougainvillia bitentaculata Uchida 1925

1 mm high, 0·8 mm wide. Oral tentacles short, divided twice; gonads interradial, large, ovoid. Only two large tentacles in each perradius; one black ocellus just above and between the tentacle bases.

UCHIDA 1925*b*, p. 84, fig. 10: *Bougainvillia bitentaculata* n.sp.; Japan. UCHIDA 1927*a*, p. 220: Japan. YAMAZI 1958, p. 135: Tanabe Bay, Japan.

Bougainvillia bougainvillei (Brandt 1835)

9 mm high, somewhat higher than wide, moderately thick. Manubrium small, oral tentacles divided four times, without terminal knobs(!); gonads interradial. About 15 tentacles in each bulb, with ocelli.

BRANDT 1835, p. 29: as *Hippocrene bougainvillii* n.sp.; Bering Sea. MAYER 1910, p. 162: a doubtful synonym of *Bougainvillia superciliaris* L. Agassiz. HARTLAUB 1911, p. 159, fig. 140: *Bougainvillia bougainvillei* = *B. mertensi* L. Agassiz 1862, *Hippocrene mertensi* Haeckel, ? = *H. mertensi* Murbach & Shearer 1902; non = *B. superciliaris* L. Agassiz 1862; (Bering Sea; British Columbia and San Francisco, west coast of N. America). BIGELOW 1913, p. 9: may be identical with *B. superciliaris*. HARTLAUB 1917, p. 406. FOERSTER 1923, p. 245. THIEL 1932*a*, p. 132. THIEL 1932*b*, pp. 440 ff.: distribution. NAUMOV 1956*b*, p. 37.

Bougainvillia britannica (Forbes 1841)

12 mm high, 10 mm wide, walls thick; bell cavity spacious, no peduncle. Manubrium short and broad, cross-shaped in cross-section; oral tentacles with long basal trunk, in distal part divided 4–6 times with small terminal knobs; gonads adradial. Marginal bulbs about half as broad as intervals, each provided with about 30 tentacles; tentacles thin, ocellus a fine transverse line.

FORBES 1841, p. 84, Pl. 1, fig. 2: as *Hippocrene britannica* n.sp.; Cornwall, southern England. FORBES 1848, p. 62, Pl. 12, fig. 1: as *Bougainvillea britannica*; Shetland Islands. MAYER 1910, p. 161, Pl. 17, fig. 8: *Bougainvillia britannica*, = *B. ramosa* (Van Beneden 1844); (N.W. Europe); Eastport, Maine, U.S.A. HARTLAUB 1911, pp. 160, 162, figs. 141–3, 145–9: *B. britannica* Forbes 1848, = *B. bella* + *xantha* Hartlaub 1897, *Margelis ramosa* L. Agassiz 1862, Haeckel 1879, Hartlaub 1894, ? = *B. britannica* Forbes 1841; non = *B. ramosa* (Van Beneden 1844). Hydroid *B. flavida* Hartlaub? (N.W. Europe); p. 169: as *B. britannica* var. *coeca* nov.var.; Den Helder, Holland. INT. PLANKT. CATAL. III 1916, p. 42: England; Ireland. LEBOUR 1917, p. 161: Plymouth. DICK 1919, p. 91: Firth of Clyde, Scotland. ?BIGELOW 1920, p. 5H: *B. britannica*; S. Alaska, determination uncertain. SVERDRUP 1921, p. 19, Pl. 3, fig. 11: Kristianafjord, Norway. ?FOERSTER 1923, p. 245: report of Bigelow 1920. LEBOUR 1923, p. 82, fig. 7: food. COY 1924, p. 55: Cullercoats, England. PEACOCK 1924, p. 59: Cullercoats, England. KRAMP & DAMAS 1925, p. 263: Norway. MARSHALL 1925, p. 127: Clyde, Scotland. KRAMP 1926*a*, p. 43: distribution. KRAMP 1927, p. 58: map, Denmark. SANDERSON 1930, p. 224: Northumberland coast, England. WATSON 1930, p. 234: Northumberland coast, England. MAR. BIOL. ASS. 1931, p. 80: Plymouth. SAVAGE 1931, pp. 40, 74: east coast of England. RUNNSTRÖM 1932, p. 27: Herdla- and Hjeltefjord, Norway.

THIEL 1935*c*, p. 165 ff.: Black Sea, hydroid. KRAMP 1937*b*, p. 47, fig. 16*b*: Denmark. MOORE 1937, p. 49: Port Erin, Isle of Man. RUSSELL 1938*b*, pp. 413, 416, 419–21, 436: Plymouth. RUSSELL 1938*d*, p. 152, figs. 23–5: nematocysts. KRAMP 1947, p. 50: Heligoland. KÜNNE 1952, pp. 9, 32, 34, 38: S.E. North Sea. FRASER 1953, p. 33: Storknes to Faxa Bay, Iceland. RUSSELL 1953, p. 158, Pl. 8, figs. 2, 3, Pl. 9, figs. 1–3, text-figs. 75A, B, 77A, B, 78A, 79A: British coasts. SOUTHWARD 1954, p. 18: Irish Sea. VANNUCCI 1956*b*, p. 248: Clyde Sea, Scotland. AURICH 1958, p. 215: frequency of occurrence in S.E. North Sea. CHOW & HUANG 1958, pp. 177, 189, Pl. 1, figs. 8, 9: Chefoo, China. KRAMP 1959*a*, pp. 109, 211, 215, 219, 220, 221, fig. 90: diagnosis; distribution. WERNER 1959*a*, p. 33: Port Erin, Isle of Man.

Bougainvillia carolinensis (McCrady 1857)

4 mm high and wide, dome-shaped, walls very thick. Manubrium long and narrow, about half as long as bell cavity; no peduncle; oral tentacles divided twice, with long basal trunks; gonads in longitudinal, interradial, swollen regions. Marginal bulbs small, bulbous, each with 7–9 tentacles, slender and quite stiff, each with a large dark-brown or black ocellus.

MCCRADY 1857, p. 164, Pl. 10, figs. 8–10: as *Hippocrene carolinensis* n.sp.; South Carolina, U.S.A. ALLMAN 1871, p. 316: *Bougainvillia carolinensis.* MAYER 1910, p. 165, Pl. 16, figs. 7–9, Pl. 17, fig. 7: New England; Tortugas, Florida. HARTLAUB 1911, p. 187. VANHÖFFEN 1913*a*, p. 418: Tortugas, Florida. BIGELOW 1914*b*, p. 9: New England. FISH 1926, pp. 123, 124: Woods Hole, U.S.A. COWLES 1930, p. 331: Chesapeake Bay, U.S.A. ?VANNUCCI 1951*a*, p. 78: Brazil. ?VANNUCCI 1951*b*, pp. 111, 114, 116: Brazil. (Probably *B. platygaster.*) KRAMP 1955*a*, p. 249: Gold Coast, W. Africa. KRAMP 1957*a*, pp. 11, 12: comparison with *B. platygaster.* VANNUCCI 1957*d*, p. 102: as *B. carolinae.* KRAMP 1959*a*, pp. 12, 110, 211, 227, 231, 265, 266, fig. 92: diagnosis; distribution.

Bougainvillia charcoti Le Danois 1913

9 mm. Globular, jelly very thick, exumbrella with deep, perradial furrows. Bell cavity narrow; manubrium short, without peduncle, flatly extended and pulled out in four small, perradial pockets; mouth-corners divided twice(!). Marginal bulbs composed of 18 ‘elements’, each with a red ocellus, no tentacles. Doubtful species, probably = *B. ramosa.*

LE DANOIS 1913*a*, p. 111: *Bougainvillia charcoti* n.sp.; preliminary description. LE DANOIS 1913*b*, p. 15, figs. 1–3: description; Little Minch, the Hebrides, Scotland. LE DANOIS 1913*c*, p. 352. HARTLAUB 1917, p. 406: report of Le Danois 1913; doubtful species. RUSSELL 1953, p. 159: ? = *B. britannica.* KRAMP 1959*a*, p. 111: doubtful species.

Bougainvillia flavida Hartlaub 1897

2 mm high, 3 mm wide, thick walls. Manubrium small, conical, about half of the length of bell cavity, no peduncle; oral arms divided three times; gonads four, interradial. Marginal bulbs swollen, fairly large, bulbous, each

with not more than six tentacles; ocelli black. Probably = *B. ramosa.* (Acc. to Russell 1953 = *B. britannica*?)

HARTLAUB 1897, p. 456, Pl. 14, figs. 1–10, Pl. 15, figs. 4–6, 8: *Bougainvillia flavida* n.sp.; Heligoland. MAYER 1910, p. 168. HARTLAUB 1911, p. 189, figs. 168, 169: probably *B. ramosa.* GROBBEN 1915, p. 4: Adriatic Sea. NEPPI 1915, p. 4: Adriatic Sea. ?LING 1937, p. 355, fig. 5: Chekiang coast, China. RUSSELL 1953, pp. 159, 164: ? = *B. britannica.* ?CHIU 1954, pp. 45, 52: China. KRAMP 1959*a*, p. 109: probably = *B. ramosa.*

Bougainvillia frondosa Mayer 1900

2 mm high, 1·25 mm wide, walls thick, dome-like with vertical sides. Manubrium short, thick, cruciform, flask-shaped, half as long as bell cavity; oral tentacles with long basal trunks, divided 2–3 times; gonads eight, adradial; planulae develop upon sides of stomach. Marginal bulbs small, with two long tentacles; no ocelli.

MAYER 1900*b*, p. 41, Pl. 3, fig. 5: *Bougainvillia frondosa* n.sp.; Tortugas, Florida. MAYER 1910, p. 171, Pl. 16, fig. 6. BERRILL 1950, p. 308. VANNUCCI 1957*d*, p. 37, 52, 89, 98, 101, 102: Brazil. KRAMP 1959*a*, pp. 110, 231, fig. 95: diagnosis; distribution.

Bougainvillia fulva Agassiz & Mayer 1899

14 mm high, 11 mm wide; cylindrical with flatly rounded top; bell-walls thick. Manubrium wide, about half as long as bell cavity, no peduncle; oral arms divided eight times; eight adradial gonads. Marginal bulbs epaulet-shaped, each with 15–20 tentacles, fairly short, clavate and flexible; ocelli black.

AGASSIZ & MAYER 1899, p. 162, Pl. 2, fig. 6: *Bougainvillea fulva* n.sp.; Fiji Islands. MAYER 1910, pp. 160, 492: (Ellice Islands; Malay Archipelago; Acapulco Harbour, Mexico; Djibuti, East Africa). VANHÖFFEN 1911*a*, p. 207: survey of distribution; Nias Islands and Seychelles, Indian Ocean. BROWNE 1916*a*, p. 178: Chagos Archipelago and Amirante Islands, Indian Ocean. BIGELOW 1919, p. 280: Philippines. FOERSTER 1923, p. 245: (Mexico). ?UCHIDA 1927*a*, p. 221, fig. 40: Japan. KRAMP 1928, p. 47, figs. 21–3: Philippines; Sunda Strait. STIASNY 1928*b*, p. 207: Semarang, Java Sea. MENON 1932, p. 11: Madras, India. ?UCHIDA 1938*a*, p. 145: Amakusa, Japan. UCHIDA 1947*a*, p. 301: Palao Islands, Pacific Ocean. NAIR 1951, p. 54: Trivandrum coast, India. KRAMP 1953, p. 264: N.E. Australia. ?CHIU 1954*b*, p. 55: China. KRAMP 1957*a*, p. 12: comparison with *B. platygaster.* VANNUCCI 1957*d*, p. 102. GANAPATI & NAGABHUSHANAM 1958, pp. 92, 93: Vizagapatam coast, India. KRAMP 1958*b*, p. 341: S.W. of Andaman Islands, Mergui Archipelago and Orissa coast, Indian Ocean. KRAMP 1959*a*, p. 12.

Bougainvillia involuta Uchida 1947

4 mm high, 4·5 mm wide, thick, bell cavity half as deep as bell height. Manubrium with short peduncle; oral tentacles divided up to seven times; gonads interradial, united in large specimens. In larger specimens the

epaulets cover the larger part of bell margin, each with up to 60 tentacles with adaxial ocelli.

UCHIDA 1947*a*, p. 301, fig. 4: *Bougainvillia involuta* n.sp.; Palao Islands, central Pacific.

Bougainvillia macloviana Lesson 1843

15 mm high, 13 mm wide, cylindrical, with fairly thick walls and rounded top. Manubrium on broad, conical peduncle; oral tentacles with very short trunk divided 5–7 times; gonads extending along perradial lobes of stomach upwards on peduncle. Marginal bulbs V-shaped, each with 35–65 tentacles in double row; ocelli brownish-black.

LESSON 1830, p. 118, Pl. 14, figs. 3, D–D‴: as *Cyanea bougainvillii* n.sp.; Falkland Islands. LESSON 1843, p. 344: *Bougainvillea macloviana* nov. nom. MAYER 1910, p. 160. HARTLAUB 1911, p. 156, fig. 139: Heligoland. VANHÖFFEN 1911*a*, p. 208: as *Hippocrene macloviana*; east of Kerguelen Island, Indian Ocean. VANHÖFFEN 1912, p. 359, Pl. 25, fig. 1: as *H. macloviana*; Kerguelen Island. ?VANHÖFFEN 1913*b*, p. 11, Pl. 1, fig. 7, Pl. 2, fig. 10: Pacific off southern S. America. HARTLAUB 1917, p. 406: Heligoland; report of Vanhöffen 1911, 1912. KRAMP 1928, p. 50: Campbell Island, Pacific Ocean. KÜNNE 1933, pp. 249–54, fig. 1: new description; S.E. North Sea; (all localities). KRAMP 1937*b*, p. 48, fig. 18*a*. BROWNE & KRAMP 1939, p. 284, Pl. 14, fig. 6, Pl. 15, figs. 7–14: Falkland Islands. KRAMP 1948*a*, p. 4: Falkland Islands (new record). KÜNNE 1952, pp. 10, 32: S.E. North Sea. RUSSELL 1953, p. 173, figs. 86, 87, 88A, B. KRAMP 1957*a*, pp. 9, 96, 124: near Falkland Islands. KRAMP 1957*b*, pp. 155, 162: Kerguelen Island. EDWARDS 1958, p. 1565: Firth of Clyde, Scotland. KRAMP 1959*a*, pp. 107, 215, 217, 235, 237, 269, fig. 85: diagnosis; distribution.

Bougainvillia maniculata Haeckel 1864

1·5 mm high and wide, almost spherical, walls fairly thin. Manubrium flask-shaped with narrow base; stomach with long, narrow throat projecting beyond velar opening; oral tentacles with long basal trunks, in distal part divided twice; four interradial gonads. Marginal bulbs small, globular, with four short, finger-shaped tentacles; ocelli large.

HAECKEL 1864, pp. 327, 340: *Bougainvillia maniculata* n.sp.; Villefranche; Nizza, Mediterranean Sea. MAYER 1910, p. 170, fig. 92: a degenerate form? HARTLAUB 1911, p. 153. KRAMP 1959*a*, pp. 109, 223, 226: diagnosis; distribution.

Bougainvillia multicilia (Haeckel 1879)

6 mm high, 5 mm wide, with thin walls. Manubrium globular to flask-shaped, with constricted base; no peduncle; oral tentacles simple, unbranched; eight adradial gonads. Marginal bulbs kidney-shaped, with 10–12 tentacles; ocelli dark-red. Doubtful species.

HAECKEL 1879, p. 81, Pl. 6, fig. 13: as *Lizusa multicilia* n.sp.; Straits of Gibraltar. MAYER 1910, p. 164. KRAMP 1955*a*, p. 249: doubts the correctness of Haeckel's description. KRAMP 1959*a*, p. 111: doubtful species.

Bougainvillia multitentaculata Foerster 1923

10 mm high and wide, rounded at the top, gelatinous substance quite thick. A low, broad peduncle; gonads perradial(!); oral tentacles divided 6–7 times. Marginal bulbs like a wide, inverted V, each with 50–60 short tentacles, ocelli brown, in a zigzag row.

FOERSTER 1923, p. 245, Pl. 2, fig. 7, Pl. 3, figs. 1, 2: *Bougainvillia multitentaculata* n.sp.; Vancouver.

Bougainvillia nigritella Forbes 1848

3 mm high and wide, globular. Oral tentacles divided twice. Marginal bulbs with only one tentacle each. Doubtful species.

FORBES 1848, p. 63, Pl. 12, fig. 2: *Bougainvillea nigritella* n.sp.; Shetland Islands, N. of Britain. HARTLAUB 1911, p. 169, fig. 152: doubtful species. RUSSELL 1953, p. 159: ? = *B. britannica*. KRAMP 1959*a*, p. 110: doubtful species.

Bougainvillia niobe Mayer 1894

7 mm high, 5 mm wide. With vertical sides and flatly rounded apex; bell walls thick. No peduncle. Manubrium flask-shaped, cross-shaped in section, about half as long as bell cavity; oral tentacles with long basal trunks, divided four times; medusa-buds from eight adradial sides of stomach; eight adradial gonads. Marginal bulbs small, oval, each with eight tentacles, ocelli dark.

MAYER 1894, p. 236, Pl. 1, fig. 2: *Bougainvillia niobe* n.sp.; Bahamas. MAYER 1910, p. 166, Pl. 18, figs. 1–3, text-fig. 90. BIGELOW 1918, p. 368: comparison with other species; only medusa-buds separate *B. niobe* from *B. fulva*; Chesapeake Bay, eastern U.S.; Bermuda; Bahamas; Florida Strait. BIGELOW 1938, p. 104: morphological remarks; Bermudas. MOORE 1949, pp. 6, 91–2, figs. 1, 2: Bermuda; Gulf Stream. BERRILL 1950, p. 308, fig. 8D–F: bud formation. KRAMP 1957*a*, pp. 11, 12: comparison with *B. platygaster*. KRAMP 1959*a*, pp. 11, 110, 232, 242, 247, 250, 251, fig. 93: Sargasso Sea; West Indies; diagnosis; distribution.

Bougainvillia nordgaardi (Browne 1903)

4–5 mm high and wide, oval, walls not very thick; a peduncle may be indicated. Stomach fairly small; oral tentacles divided 4–5 times, basal trunk short but distinct; four interradial gonads, well separated in the perradii. Marginal bulbs small, globular, with 5–7 tentacles; no ocelli.

BROWNE 1903, p. 14, Pl. 2, fig. 1, Pl. 3, figs. 5, 6: as *Margelis nordgaardii* n.sp.; Bergen, Norway. MAYER 1910, p. 168, fig. 91: *Bougainvillia nordgaardii*. HARTLAUB 1911, p. 192, fig. 171: (Norway); Wyville Thompson Ridge, N.E. Atlantic. VANHÖFFEN 1911*a*, p. 207: as *B. britannica* in part (acc. to Hartlaub 1911); S. of Wyville Thompson Ridge, N.E. Atlantic. ?VANHÖFFEN 1913*b*, p. 10, Pl. 1, fig. 6: Chile and Peru. HARTLAUB 1917, p. 407: discussion of Vanhöffen 1913*b*. SVERDRUP 1921, p. 20, Pl. 3, fig. 13: Kristianiafjord, Norway. FOERSTER 1923, p. 246, Pl. 3, figs. 3, 4: Vancouver, W. Canada. KRAMP & DAMAS 1925, p. 256, figs. 8–12: development; Norway. KRAMP 1926*a*, p. 43: distribution. RUNNSTRÖM 1932,

p. 27: Herdlafjord, Norway. KRAMP 1937*b*, p. 49, fig. 18*b*. REES 1938, p. 2, fig. 1: as *B. muscoides* (M. Sars 1846); the hydroid of *B. nordgaardi* is *Perigonimus muscoides* Sars. REES 1953*a*, p. 8: Herdlafjord, Norway. EDWARDS 1958, p. 1564: as *B. muscoides*; Firth of Clyde, Scotland. KRAMP 1959*a*, pp. 110, 215, 216, 218, 219, 220, fig. 94: diagnosis; distribution.

Bougainvillia platygaster (Haeckel 1879)

12 mm high and wide, with thick walls, flattened apex and vertical sides; no peduncle. Stomach quadrangular, very flat; oral tentacles short, divided 5–6 times immediately from base; gonads interradial. Marginal bulbs triangular, with 10–13 tentacles; ocelli crescent-shaped. Medusa-buds are produced either directly from stomach walls or from polypoid structures issuing from stomach walls and terminating in hydranths with mouth and tentacles.

HAECKEL 1879, p. 91: as *Hippocrene platygaster* n.sp.; Cape Verde; Canary Islands; Atlantic Ocean. MAYER 1910, p. 165: *Bougainvillia platygaster*. VANHÖFFEN 1912, p. 359: as *B. niobe*; southern Atlantic. THIEL 1938*c*, p. 299: N.W. of Cape Verde, W. Africa. KRAMP 1948*a*, p. 4: as *B. niobe*; off east coast of Brazil. VANNUCCI 1951*a*, p. 78: as *B. carolinensis*; Brazil. VANNUCCI 1951*b*, pp. 111, 114, 116: as *B. carolinensis*; Brazil. KRAMP 1955*a*, p. 308: report of Haeckel. KRAMP 1955*b*, p. 155: *B. platygaster* a valid species, distinct from *B. carolinensis, fulva* and *niobe*. KRAMP 1957*a* pp. 9, 90, 97, 125, Pl. 3, figs. 1–6, text-fig. 1, map: asexual propagation by polypoid and medusoid buds; carrier of larvae of Narcomedusae; western tropical Atlantic Ocean; off East Africa. VANNUCCI 1957*d*, p. 102. KRAMP 1959*a*, pp. 8, 9, 12, 73, 108, 224, 232, 234, 242, 247, 250, 251, 270, fig. 89: West Indies; Sargasso Sea; central tropical Atlantic (new records); diagnosis; distribution.

Bougainvillia principis (Steenstrup 1850)

10 mm high and wide, globular, gelatinous substance moderately thick. Manubrium without peduncle, short and broad, with deep interradial furrows; oral arms short, divided 5–6 times, almost from base; gonads adradial, swollen. Marginal bulbs linear, wider than interspaces, with 30–40 tentacles in a single row; ocelli black, linear (but larger than in *B. britannica*).

Steenstrup 1850, p. 35: as *Margelis principis* n.sp.; Faroes. MAYER 1910, p. 160: *Bougainvillia principis*, = *B. fruticosa* – *allmani* Romanes. (Scotland; North Sea; Faroes). HARTLAUB 1911, p. 177, fig. 158: (all localities); Barents Sea (*B. aurea* Linko). LE DANOIS 1913*d*, p. 307, fig. 5: Thorshavn, Faroes. KRAMP & DAMAS 1925, p. 263: Norway. KRAMP 1926*a*, p. 48: map. *Nemopsis heteronema* in part = *B. principis*; Iceland; Faroes; Scotland; North Sea. KRAMP 1927, p. 56: Denmark. MAR. BIOL. ASS. 1931, p. 80: Plymouth. THIEL 1932*a*, p. 132. THIEL 1932*b*, pp. 440 ff.: distribution. KRAMP 1937*b*, p. 47, fig. 17: Denmark. MOORE 1937, p. 49: Port Erin Bay, Isle of Man. RUSSELL 1938*b*, pp. 413, 416, 417, 423: Plymouth. KRAMP 1939*a*, p. 6: Iceland. KRAMP 1942, p. 32: W. Greenland (new to Greenland). KRAMP 1947, p. 50: N.E. Atlantic Ocean. KRAMP 1948*b*, p. 20: S.W. of Ireland; Rockall Bank. YASHNOV 1948, p. 70, Pl. 19, fig. 2: Barents Sea. REES 1953*a*, p. 8: Herdlafjord, Norway. RUSSELL 1953, p. 164, Pl. 8, fig. 4, text-figs. 76A, B, 78B, 79B: British waters. KRAMP 1955*b*, pp. 154, 155: by Haeckel 1879 determined as *Margelis principis* and *Nemopsis heteronema*. WIBORG 1955, p. 53:

near Faroes. Vannucci 1956*b*, pp. 245, 248: Clyde Sea, Scotland. Petersen 1957, p. 26: W. of Faroes; Cape Farewell; North Atlantic S.E. of Cape Farewell. Chow & Huang 1958, pp. 177, 189, Pl. 2, figs. 12, 13: Chefoo, China. Kramp 1959*a*, pp. 108, 208, 210, 215, 216, 218, 219, 221, fig. 88: diagnosis; distribution.

Bougainvillia prolifera (von Lendenfeld 1884)

3 mm high, 2·5 mm wide, dome-like. Manubrium small, nearly cubical; oral tentacles simple, unbranched; medusa-buds on sides of stomach. Marginal bulbs large, ' scrota-shaped ', with five tentacles; ocelli present? Doubtful species.

von Lendenfeld 1884*a*, p. 589, Pl. 23, figs. 38, 39: as *Lizusa prolifera* n.sp.; Port Jackson, New South Wales, Australia. Mayer 1910, p. 170. Kramp 1953, p. 264: doubtful species.

Bougainvillia pyramidata (Forbes & Goodsir 1853)

3–6 mm high and wide, globular, walls moderately thick. Manubrium flat, cruciform, mounted upon a broad, conical peduncle; oral tentacles divided 3–4 times; gonads adradial, elongated, on base and four perradial lobes of stomach. Marginal bulbs small, oval, with 6–9 tentacles; ocelli black.

Forbes & Goodsir 1853, p. 312, Pl. 10, fig. 4: as *Hippocrene pyramidata* n.sp.; Scotland. Mayer 1910, p. 168: *Bougainvillia pyramidata*; (Scotland; Ireland). Hartlaub 1911, p. 180, fig. 159; (all localities). Russell 1953, p. 167, fig. 82 a–c: new localities: west coast of Scotland and Ireland. Kramp 1959*a*, pp. 108, 215, 216, 222, fig. 86: diagnosis; distribution.

Bougainvillia ramosa (van Beneden 1844)

2–3·5 mm high and wide, semiglobular, jelly fairly thick. Manubrium short, oral tentacles short, divided 1–2 times (rarely three); four interradial gonads, in ♀ globular, in ♂ prolonged along perradial sides of a low and broad peduncle. Marginal bulbs small, with 3–4 (up to seven) long tentacles, ocelli black, round.

van Beneden 1844, p. 56, Pl. 4: as *Eudendrium ramosum* n.sp. Mayer 1910, p. 161: as *Bougainvillia britannica* in part =*B. ramosa*; p. 169, Pl. 16, figs. 4, 5, Pl. 17, figs. 3, 4: as *B. autumnalis* (N.W. Europe). Hadži 1911*c*, p. 190, figs. 34–6: as *Bougainvillia*; Adriatic Sea. Hartlaub 1911, p. 154, fig. 138: as *B. triestina* n.sp; Trieste; p. 183, figs. 162–7: as *Bougainvillia ramosa*, =*B. autumnalis* Hartlaub 1897, *B. gibbsi* Mayer 1900, *Lizusa octocilia* Haeckel 1879, *B. britannica* Vanhöffen 1911 in part; new record: Heligoland; (all localities). Vanhöffen 1911*a*, p. 207: as *B. britannica* in part; Great Fishbay, W. Africa. Neppi 1912, p. 722: as *B. autumnalis*; Dalmatia, Adriatic Sea. Vanhöffen 1912, p. 359: N.W. of Cape Verde Islands. Neppi & Stiasny 1913*b*, p. 51, Pl. 2, figs. 17–21*b*: as *B. autumnalis*, =*B. triestina* Hartlaub 1911; Trieste. Bigelow 1914*b*, p. 9: as *B. gibbsi*, probably =*B. autumnalis*; Newport, New England. Hartlaub 1917, p. 405: report of Neppi 1912*a* and Vanhöffen 1912. Pell 1918, p. 22: as *B. autumnalis*; Adriatic Sea. Sverdrup 1921, p. 20, Pl. 3, fig. 12: Kristianiafjord, Norway. KRAMP & DAMAS 1925, p. 254, figs. 5–7: as *B. ramosa* var. *minima* n.var.; Norway. KRAMP 1926*a*, p. 43: distribution; report. KRAMP 1927, p. 62: Denmark. ?UCHIDA 1927*a*, p. 222: as *Bougainvillia* sp., probably *B. ramosa*; Japan. ?COWLES 1930, p. 331: Chesapeake Bay, U.S.A. (determination uncertain). KRAMP 1930, p. 13: Zeebrugge, Belgium. MAR. BIOL. ASS. 1931, p. 80: Plymouth. KRAMP 1937*b*, p. 44, fig. 15: Denmark. MOORE 1937, p. 49: as *B. ramosa+pyramidata*; Isle of Man. PELL 1938, p. 924: as *B. autumnalis*; Adriatic Sea. RUSSELL 1938*b*, pp. 413, 416, 417: Plymouth. RUSSELL 1938*d*, p. 152: nematocysts. KRAMP 1939*a*, p. 6: hydroid; Iceland. BABNIK 1948, p. 16, fig. 2: as *B. autumnalis*; Adriatic Sea; p. 72: *B. autumnalis* var. *magna* n.var.; biological remarks. KÄNDLER 1950, p. 67: Fehmarnbelt, Baltic Sea. FRANC 1951, p. 27: St Malo, French Channel coast. DEEVEY 1952*b*, pp. 150, 151: as *B. autumnalis*; Block Island Sound, east coast of U.S.A. KÜNNE 1952, pp. 9, 32: S.E. North Sea. RUSSELL 1953, p. 153, Pl. 8, fig. 1, Pl. 9, figs. 4, 5, text-fig. 74A–C: *B. ramosa*; British coasts; *B. triestina* is temporarily kept distinct. SOUTHWARD 1954, p. 18: Irish Sea. VANNUCCI 1956*b*, pp. 245, 249: Clyde Sea, Scotland. VALKANOV 1957, p. 16: Black Sea. VANNUCCI 1957*d*, pp. 37, 53, 89, 99, 101, 102: Brazil. VUČETIC 1957, p. 37: as *B. autumnalis*; rock pools, Mljet Island, Adriatic Sea. KRAMP 1959*a*, pp. 109, 211, 215, 218, 221, 223, 227, fig. 91: diagnosis; distribution.

Bougainvillia rugosa Clarke 1882

1·5 mm, pyriform. Manubrium short, thick, flask-shaped; gonads not developed; oral tentacles unbranched. Marginal bulbs small, globular, with three tentacles, with ocelli. (Description of young, newly reared medusae.)

CLARKE 1882, p. 140, Pl. 8, figs. 21–24: *Bougainvillia rugosa* n.sp.; hydroid; Virginia, U.S.A. MAYER 1910, p. 171, Pl. 17, fig. 2: hydroid and newly hatched medusa; Charleston Harbour, South Carolina, U.S.A. KRAMP 1959*a*, p. 110, fig. 96: diagnosis.

Bougainvillia simplex (Forbes & Goodsir 1853)

Globular. Oral tentacles divided twice. Marginal bulbs four-lobed, with four ocelli, but with only one tentacle each. Doubtful species.

FORBES & GOODSIR 1853, p. 313, Pl. 10, fig. 6: as *Hippocrene simplex* n.sp.; Scotland. HARTLAUB 1911, p. 181, fig. 160: *Bougainvillia simplex*, = *Thamnitis nigritella* Haeckel 1879. RUSSELL 1953, p. 159: ? = *B. britannica*. KRAMP 1959*a*, p. 110: doubtful species.

Bougainvillia superciliaris (L. Agassiz 1849)

7–9 mm high and wide, almost globular, walls very thick. Stomach short, on broad base, cross-shaped in section, on well-developed peduncle of about same width as stomach; gonads interradial, almost quadratic, on stomach walls only; oral tentacles with short, thick basal trunk, divided 4–5 (rarely 6–7) times, branches short. Marginal bulbs crescent-shaped, less than half as wide as interradial spaces, with 11–15 (up to 22) tentacles; ocelli large, round, black. Planulae developing on stomach walls.

L. AGASSIZ 1849, p. 250, Pls. 1–3, 53 figs.: as *Hippocrene superciliaris* n.sp. L. AGASSIZ

1862, pp. 289, 291, 344, Pl. 27, figs. 1–7, figs. 37–9: *Bougainvillia superciliaris.* MAYER 1910, p. 162, Pl. 17, fig. 1, text-figs. 87–8: New England; Maine; N. of Cape Cod; (W. Greenland; White Sea; Barents Sea; Heligoland). HARTLAUB 1911, p. 171, figs. 153–7: medusa and hydroid; (all localities; N.W. Europe; Spitzbergen). BIGELOW 1913, p. 9: Attu Island, N.W. Pacific. KRAMP 1913*a*, p. 265: W. Greenland. BIGELOW 1914*b*, p. 8: New England. BIGELOW 1914*d*, p. 407: Massachusetts Bay, east coast of U.S.A. KRAMP 1914, p. 405: W. Greenland. HARTLAUB 1917, p. 406: report of Bigelow 1913 and Kramp 1913*a*; new record: Heligoland. ?FOERSTER 1923, p. 246: Departure Bay, Vancouver. JESPERSEN 1923, p. 108: Disko Bay, W. Greenland. KRAMP & DAMAS 1925, p. 263: Norway; Spitzbergen. BIGELOW 1926, p. 43: Gulf of Maine, east coast of U.S.A. FISH 1926, pp. 123, 124: Woods Hole, east coast of U.S.A. KRAMP 1926*a*, p. 44: map; Greenland; Iceland. KRAMP 1927, p. 57: Denmark. KRAMP 1930, p. 13: S.E. England. THIEL 1932*a*, p. 132. THIEL 1932*b*, pp. 440 ff.: distribution. FROST 1937, p. 26: Newfoundland. KRAMP 1937*b*, p. 45, fig. 16*a*: Denmark. KÜNNE 1937*b*, p. 6: Baltic Sea. KRAMP 1939*a*, p. 5: Iceland. DUNBAR 1942, p. 73: eastern arctic Canada. KRAMP 1942, p. 29: W Greenland KRAMP 1948*b*, p. 20: Faroe-Shetland Channel. YASHNOV 1948, p. 69, Pl. 19, fig. 1: as *B. (Hippocrene) superciliaris*; Barents Sea; White Sea; Kara Sea; Bering Sea. VIBE 1950, p. 103: N.W. Greenland. KÜNNE 1952, pp. 9, 30, 32, 39: S.E. North Sea. RUSSELL 1953, p. 169, figs. 83A, B, 84A, B, 85A–C. KRAMP 1955*b*, pp. 154, 155: by Haeckel 1879 determined as *Margelis principis* and *H. superciliaris.* MAC GINITIE 1955, pp. 41, 118: breeding season; Point Barrow, Alaska. NAUMOV 1956*b*, p. 37 CHOW & HUANG 1958, pp. 177, 189, Pl. 2, figs. 14, 15: Chefoo, China. KRAMP 1959*a*, pp. 108, 208–11, 215, 217, 218, 219, 221, 269, fig. 87: diagnosis; distribution.

Bougainvillia trinema (von Lendenfeld 1884)

3 mm wide, oval. Manubrium small; oral arms end in three branches; gonads not developed. Marginal bulbs small, with three tentacles. Doubtful species.

VON LENDENFELD 1884*a*, p. 918, Pl. 41, fig. 13: as *Margelis trinema* n.sp; Sydney Harbour, Australia. MAYER 1910, p. 171: *Bougainvillia trinema,* ? = juv. of *B. fulva.* KRAMP 1953, pp. 264, 310: doubtful species, but different from *B. fulva.*

Bougainvillia sp.

CHIU 1954*a*, p. 42: Amoy, China. CHIU 1954*b*, p. 50: China.

Genus ***Chiarella*** Maas 1897

Bougainvilliidae with eight cleft tentacle-clusters, so that the tentacles arise from 16 epaulet-shaped, marginal swellings. Oral tentacles dichotomously branched.

Type-species: *C. centripetalis* Maas.

MAAS 1897, p. 15: *Chiarella* n.g. MAYER 1910, p. 182.

Chiarella centripetalis Maas 1897*

15–25 mm high, 10–15 mm wide, dome-like, fairly thick at apex, but thin at margin. Stomach barrel-shaped, shorter than half of bell cavity; eight adradial gonads; four oral tentacles, divided 5–6 times. Tentacles very short; up to 40 or more tentacles on each double-epaulet, with adaxial ocelli. Eight adradial, lappet-like emarginations which alternate with the radial and interradial clusters of tentacles.

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* See Addenda, p. 444.

MAAS 1897, p. 15, Pl. 2, figs. 1–4: *Chiarella centripetalis* n.g., n.sp.; Gulf of California, Pacific coast of Mexico. MAYER 1910, p. 182, fig. 96. VANHÖFFEN 1912, p. 361: as *Köllikeria centripetalis*. FOERSTER 1923, p. 247. KRAMP 1928, p. 53: *C. centripetalis*; remarks to Vanhöffen 1912. BIGELOW 1940, p. 294, figs. 11–12: Gulf of California. NAUMOV 1956*b*, p. 36, text-fig.: as *Rathkea jaschnowi* n.sp.; Bering Sea and Sea of Okhotsk.

Genus ***Koellikerina*** Kramp 1939

Bougainvilliidae with eight groups of marginal tentacles, all alike in structure; with four oral tentacles dichotomously branched; marginal tentacles with or without adaxial ocelli.

Type-species: *K. fasciculata* (Péron & Lesueur).

L. AGASSIZ 1862, p. 345: *Köllikeria* n.g. MAYER 1910, p. 179: as *Rathkea*. KRAMP 1939*b*, p. 511: *Köllikeria* preoccupied for a trematode; as *Koellikerina* n.nom.; historical review.

Koellikerina constricta (Menon 1932)

4 mm high, pyriform, with a solid, gelatinous apex; bell with characteristic constriction about 1/3 of its height from the top. Manubrium half as long as bell cavity, on a short peduncle; oral tentacles divided several times, their ultimate branches very short; gonads V-shaped, perradial, distinctly folded. Marginal tentacles eight in each group, with reddish-brown spots on the bases.

MENON 1932, p. 11, Pl. 2, fig. 11: as *Köllikeria constricta* n.sp.; Madras, India. KRAMP 1939*b*, p. 512: *Koellikerina constricta*. KRAMP 1959*c*, p. 231.

Koellikerina elegans (Mayer 1900)

3–7 mm high, dome-like, sides almost vertical, walls moderately thick. Manubrium pear-shaped, small, upon a well developed, slender, conical peduncle; four oral tentacles, divided three times, each tip with three small branches with nematocysts. Tentacles stiff, curved upwards, four in the perradial, three in the interradial groups, all with dark-brown ocellus on the adaxial side.

MAYER 1900*b*, p. 44, Pl. 38, fig. 127: as *Lizzia elegans* n.sp; Tortugas, Florida. MAYER 1910, p. 181, Pl. 18, fig. 4: as *Rathkea elegans*. HARTLAUB 1911, p. 156: belongs to *Bougainvillia*. KRAMP 1928, p. 52: *Köllikeria elegans*. KRAMP 1939*b*, p. 512: *Koellikerina elegans*. NAIR 1951, p. 55: *Kollikerina elegans*; Trivandrum coast, India. GANAPATI & NAGABHUSHANAM 1958, pp. 92, 94: as *Köllikeria elegans*; Vizagapatam coast, India. KRAMP 1959*a*, pp. 112, 231, 272, fig. 99: diagnosis; distribution. KRAMP 1959*c*, p. 231.

Koellikerina fasciculata (Péron & Lesueur 1809)

8 mm high, 9 mm wide, barrel-shaped with flatly rounded apex. Stomach upon a short, broad peduncle, with four perradial, horse-shoe-shaped gonads with transverse furrows; oral tentacles divided seven times. 10–13 tentacles in each of the eight marginal clusters, each with an adaxial ocellus.

PÉRON & LESUEUR 1809, p. 353: as *Melicerta fasciculata* n.sp.; Mediterranean. L. AGASSIZ 1862, p. 345: as *Köllikeria fasciculata* n.g. MAYER 1910, p. 179, fig. 94: as *Rathkea fasciculata*; Naples, Mediterranean, new record. HARTLAUB 1911, pp. 156, 229: as *Köllikeria fasciculata*. PELL 1918, pp. 22, 23, 25: as *R. fasciculata*; Adriatic Sea. NEPPI 1919, p. 119, fig. 1: as *Rathkea fasciculata*; abnormal specimen. KRAMP 1924, p. 3, map: as *Köllikeria fasciculata*; Mediterranean. RANSON 1925*b*, p. 380: as *Rathkea fasciculata*; Mediterranean. KRAMP 1928, p. 52: as *Köllikeria fasciculata*. RANSON 1932*a*, p. 995: as *Köllikeria fasciculata*; Algerie; *Rathkea blumenbachiana* from Black Sea possibly –*K. fasciculata*. THIEL 1935*c*, p. 165: as *Köllikeria fasciculata*; Black Sea. RANSON 1936*b*, p. 56: as *Köllikeria fasciculata*; Baleares, Mediterranean. PELL 1938, p. 924: as *Rathkea fasciculata*; Adriatic Sea. KRAMP 1939*b*, pp. 511–12: *Koellikerina fasciculata*. BABNIK 1948, p. 19: as *Rathkea fasciculata*; Adriatic Sea. KRAMP 1948*b*, p. 20: S.W. of Azores, new for the Atlantic Ocean. HURE 1955, p. 6: as *R. fasciculata*; Adriatic Sea. KRAMP 1955*b*, p. 155. EBBECKE 1957, p. 151: as *Lizzia Kölliker*; reflex investigations; Naples. non KRAMP 1958*a*, p. 118, text-fig. 1: Villefranche, Mediterranean. KRAMP 1959*a*, pp. 112, 222, 223, 225, fig. 98: diagnosis; distribution. KRAMP 1959*c*, p. 231.

Koellikerina maasi (Browne 1910)

10 mm high, 9 mm wide, walls very thick. Stomach without a peduncle, fairly large, cross-shaped; four oral tentacles divided 7–8 times; gonads four masses, covering nearly the whole interradial walls of stomach, separated perradially. Eight marginal groups of 5–7 tentacles each; no ocelli.

BROWNE 1910, p. 22, Pl. 4, figs. 1–5: as *Köllikeria maasi* n.sp.; McMurdo Sound, Antarctic. VANHÖFFEN 1912, p. 361, Pl. 25, fig. 2: as *Köllikeria maasi*; discussion of species; Antarctic. KRAMP 1928, p. 52: as *Köllikeria maasi*. KRAMP 1939*b*, p. 512: *Koellikerina maasi*. KRAMP 1957*a*, pp. 8, 124: Weddell Sea, Antarctic. KRAMP 1959*a*, pp. 112, 235, 269, fig. 100: diagnosis; distribution. KRAMP 1959*c*, p. 231.

Koellikerina multicirrata (Kramp 1928)

3 mm high and wide, with fairly thin walls; apparently no peduncle. Manubrium short; eight adradial groups of gonads each consisting of three swellings; four oral tentacles divided 6–7 times. Eight marginal epaulets touching each other, each with 14–15 tentacles, each with an adaxial, large, black ocellus.

KRAMP 1928, p. 51, fig. 24: as *Köllikeria multicirrata* n.sp.; Kei Islands, Pacific Ocean. KRAMP 1939*b*, p. 512: *Koellikerina multicirrata*. KRAMP 1959*c*, p. 231.

Koellikerina octonemalis (Maas 1905)

5–6 mm high, 4–5 mm wide; with thick walls, bulging sides and flat apex.

Stomach upon a short, wide, conical peduncle; oral tentacles divided 4–5 times. Four interradial gonads, doubly cleft. Marginal tentacles 7–9 in the perradial, 5–7 in the interradial clusters, with black, adaxial ocelli.

MAAS 1905, p. 12, Pl. 2, figs. 11, 12: as *Rathkea octonemalis* n.sp.; Malay Archipelago. MAYER 1910, p. 180, fig. 95: as *Rathkea octonemalis*. HARTLAUB 1911, p. 156: belongs to *Bougainvillia*. KRAMP 1928, p. 52: as *Köllikeria octonemalis*. KRAMP 1939*b*, p. 512: *Koellikerina octonemalis*. KRAMP 1959*c*, p. 231.

Koellikerina ornata Kramp 1959*

8 mm high, with a large, conical apical projection, pointed, with a large patch of bright orange pigment at the utmost tip. Stomach on a slender peduncle; the stomach is barrel-shaped, completely covered by the gonads which are horse-shoe-shaped, perradial in position, each with 9–11 transverse folds and uninterrupted in the perradii; mouth tube about as long as the stomach, narrowing to slender distal tube; no distinct lips. Manubrium, including peduncle and mouth tube, about half as long as the bell cavity. Four oral tentacles immediately below the stomach, dichotomously branched immediately from their base, without a basal trunk, each divided 5–6 times. The eight marginal groups of tentacles are equally wide, each with 11–13 tentacles, the spaces between the groups half as wide as the groups; each tentacle with a round, dark-red ocellus on the adaxial side near the base; moreover each of the tentacle groups is adorned with two bright orange spots on the abaxial side near their lateral edges.

KRAMP 1959*c*, p. 229, fig. 6*a–c* *Koellikerina ornata* n.sp; Ceylon.

Genus *Lizzella* Haeckel 1879

Bougainvilliidae with simple, unbranched oral tentacles; with eight marginal bulbs, all alike, the perradial and interradial bulbs having same number of tentacles. Systematic position uncertain.

Type-species: *L. octella* Haeckel.

HAECKEL 1879, p. 83: *Lizzella* n.g. MAYER 1910, p. 175: refers Vanhöffen 1891: *Lizzella* is a stage in the growth of *Rathkea*. HARTLAUB 1911, p. 150: genus *Lizzella* is retained, but its systematic position uncertain.

Lizzella hyalina (van Beneden 1866)

4 mm high, 6 mm wide; spherical to egg-shaped. Stomach egg-shaped, twice as long as the conical peduncle; gonads four, transversely folded; four simple oral tentacles. Eight marginal bulbs each with 3–4 short tentacles.

VAN BENEDEN 1866, p. 95, Pl. 3, fig. 14: as *Circe hyalina* n.sp; Belgium. HAECKEL 1879, p. 634: *Lizzella hyalina*; Normandy, Granville, France. HARTLAUB 1911, p. 151, fig. 137. KRAMP 1959*a*, p. 112: doubtful species.

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* See Addenda, p. 444.

Lizzella octella Haeckel 1879

15 mm high, 10 mm wide, egg-shaped. Stomach spherical or nearly cubical, a conical peduncle as long as stomach; eight simple oral tentacles; gonads four feather-shaped leaves in the stomach wall. Eight marginal bulbs each with eight large tentacles.

Haeckel 1879, p. 84: *Lizzella octella* n.g., n.sp.; Japan. Mayer 1910, p. 180: *L. octella* = *Rathkea octonemalis* Maas 1905. Hartlaub 1911, p. 151: non = *R. octonemalis*. Uchida 1927*a*, pp. 146, 230: *L. octella* ? = juv. of *Spirocodon saltatrix*.

Genus ***Lizzia*** Forbes 1846

Bougainvilliidae with simple, unbranched oral tentacles; gonad surrounding stomach; with eight marginal bulbs, each with one simple tentacle, or with more tentacles on the perradial than the interradial bulbs; with a stomachal peduncle; medusa buds develop upon the stomach. No ocelli.

Type-species: *L. blondina* Forbes 1848.

Forbes 1846, p. 286: *Lizzia* n.g. Mayer 1910, p. 175: refers Vanhöffen 1891; *Lizzia* is a stage in the growth of *Rathkea*. Hartlaub 1911, p. 143: *Lizzia*.

Lizzia blondina Forbes 1848

Up to 2 mm high and wide, with fairly thick apex. A short, pyramidal gastric peduncle; manubrium short, four-sided; four small, simple oral tentacles; gonad ring-shaped; medusa-buds on stomach, before the gonad is ripe. Eight marginal bulbs, perradial bulbs with up to three tentacles, interradial never more than one; frequently not all tentacles developed.

Hydroid: ?*Trichydra pudica* Wright.

Forbes 1848, p. 67, Pl. 12, fig. 4: *Lizzia blondina* n.sp; England. Mayer 1910, p. 181: as *Rathkea blondina* (coasts of England, Scotland, Ireland, Germany and Norway). ?Hadži 1911*c*, p. 194, text-figs. 40, 41: as *Dysmorphosa*; Adriatic Sea. Hartlaub 1911, p. 145, figs, 131–5: *L. blondina*, = *L. claparedii* + *Dysmorphosa minima* Haeckel 1879; all localities (N.W. Europe and Mediterranean); new record: Heligoland. ?Neppi & Stiasny 1911, p. 399: as *Podocoryne minuta*; Trieste. ?Neppi 1912, p. 721: as *Podocoryne minuta*; Dalmatia, Adriatic Sea. Neppi 1912, p. 722: as *L. claparedii* Haeckel; Dalmatia. ?Neppi & Stiasny 1913*b*, p. 24, Pl. 1, fig. 12, Pl. 2, fig. 13*a*, *b*: as *Podocoryne minuta*; Trieste. Hadži 1914, p. 289: budding. Int. Plankt. Catal. III 1916, p. 42: *L. blondina*; England; Ireland. Hartlaub 1917, p. 405: remarks to Neppi 1912. Dick 1919, p. 91: Firth of Clyde, Scotland. Sverdrup 1921, p. 18, Pl. 2, fig. 9: as *Hydractinia carnea*; Kristianiafjord, Norway. Kramp & Damas 1925, p. 266, figs. 13, 14: Norway. Kramp 1926*a*, p. 52, map: Iceland; Faroes; Shetland to Norway; English Channel. Kramp 1927, p. 65, map: Denmark. Sanderson 1930, p. 225: Northumberland coast, England. Watson 1930, p. 234: Northumberland coast, England. Mar. Biol. Ass. 1931, p. 80: Plymouth. Savage 1931, pp. 27, 30, 40: east coast of England. Candeias 1932, p. 3, Pl. 1, fig. 1: as *L. claparedii*; Portugal. Runnström 1932, p. 27: Herdla- and Hjeltefjord, Norway. Thiel 1932*a*, p. 131. Thiel 1932*b*, pp. 439 ff.: distribution. Hovasse 1935, pp. 60, 61, 65: *L. blondina* with ectoparasitic Peridinians. Kramp

1937*b*, p. 50, fig. 19: Denmark. MOORE 1937, p. 49: Port Erin, Isle of Man. RUSSELL 1938*b*, pp. 413, 416, 418: Plymouth. RUSSELL 1938*d*, p. 153, figs. 33–6: nematocysts. KRAMP 1939*a*, p. 6: Iceland. REES 1941*a*, p. 135, figs. 4, 5: hydroid of *L. blondina*, ?*Trichydra pudica* Wright; Clyde Sea, Scotland. KÜNNE 1952, pp. 9, 32, 38: S.E. North Sea. REES 1953*a*, p. 8: Herdlafjord, Norway. RUSSELL 1953, p. 145, Pl. 7, figs. 1, 2, Pl. 34, figs. 5, 6, text-figs. 69, 70A–C, 71, 72A, B: British coasts. VANNUCCI 1956*b*, p. 249: Clyde Sea, Scotland. AURICH 1958, p. 215: frequency of occurrence in S.E. North Sea. KRAMP 1958*a*, pp. 117, 127: Villefranche, Mediterranean. KRAMP 1959*a*, pp. 105, 215, 219, 221, 223, fig. 78: diagnosis; distribution. WERNER 1959*a*, p. 33: Port Erin, Isle of Man.

Lizzia elisabethae Haeckel 1879

6 mm high, 4 mm wide. Perradial marginal bulbs with four, interradial bulbs with two tentacles; an ocellus(!) at the base of each tentacle; medusa-buds not observed.

HAECKEL 1879, p. 83, Pl. 6, fig. 12: *Lizzia elisabethae* n.sp; Jersey Islands, English Channel. MAYER 1910, p. 181: *L. elisabethae* ? = *Rathkea blondina*. HARTLAUB 1911, p. 149, fig. 136: probably a valid species. KRAMP 1959*a*, p. 105, fig. 79: diagnosis.

Lizzia fulgurans (A. Agassiz 1865)

1 mm high, somewhat pyriform; soft and flexible. Manubrium on well developed peduncle, small, with four simple oral tentacles. Eight, sometimes 16, tentacles, stiff, upward curled, one on each marginal bulb. Medusa-buds on stomach.

A. AGASSIZ 1865, p. 163, figs. 259, 260: as *Dysmorphosa fulgurans* n.sp; east coast of U.S.A. MAYER 1910, p. 139, Pl. 12, figs. 5–9, Pl. 13, figs. 3–5: as *Podocoryne fulgurans*; Rhode Island; Maryland; North Carolina. HARTLAUB 1911, p. 144: is referred to *Lizzia*. BIGELOW 1914*b*, p. 7: as *P. fulgurans*; New England. KRAMP 1959*a*, pp. 105, 211, 213, fig. 80: diagnosis; distribution.

Lizzia gracilis (Mayer 1900)

3 mm wide, a little broader than high, with slight apical projection. Stomach small, on a slightly developed peduncle; four perradial and four interradial oral tentacles; medusa-buds on stomach. Eight stiff marginal tentacles, upward curled; large basal bulbs.

MAYER 1900*b*, p. 39, Pl. 36, figs. 122–4: as *Cytaeis gracilis* n.sp.; Tortugas, Florida. MAYER 1910, p. 141, Pl. 16, figs. 1–3: as *Podocoryne gracilis*. HARTLAUB 1911, p. 144: *Lizzia gracilis*. VANHÖFFEN 1913*a*, p. 418: Tortugas, Florida. KRAMP 1928, pp. 46, 47: Sunda Strait, Indonesia. KRAMP 1959*a*, pp. 105, 231, 272: diagnosis; distribution.

Lizzia octostyla (Haeckel 1879)

0·4 mm high, 0·5 mm wide, with low, conical apex. Stomach on a well developed peduncle; eight oral tentacles situated in pairs in the four perradial corners of the mouth tube; medusa-buds on stomach. Eight short marginal tentacles with small bulbs and occasionally an additional tentacle on each perradial bulb; dark pigmentation in marginal bulbs.

HAECKEL 1879, p. 78, Pl. 6, fig. 6: as *Dysmorphosa octostyla* n.sp.; Mediterranean. MAYER 1910, p. 140: as *Podocoryne octostyla*. HARTLAUB 1911, p. 211: possibly belongs to *Lizzia*. NEPPI & STIASNY 1911, p. 399: as *P. octostyla*; Trieste. NEPPI & STIASNY 1913*b*, p. 54, Pl. 2, fig. 22: *Lizzia octostyla*; Trieste. KRAMP 1928, p. 46. KRAMP 1958*a*, p. 118, fig. 1: as *Koellikerina fasciculata* juv.; Villefranche, Mediterranean. KRAMP 1959*a*, p. 106, fig. 81: diagnosis.

Genus ***Nemopsis*** L. Agassiz 1849

Bougainvilliidae with four clusters of marginal tentacles, in each cluster a median pair of club-shaped tentacles and on both sides a number of simple, filiform tentacles; with adaxial ocelli; with four perradial dichotomously branched oral tentacles. Stomach with four radial lobes extending outwards along the radial canals; gonads on these lobes.

Type-species: *N. bachei* L. Agassiz.

L. AGASSIZ 1849, p. 289: *Nemopsis* n.g. MAYER 1910, p. 172.

Nemopsis bachei L. Agassiz 1849

11 mm high, dome-shaped; rather thick walls. Stomach short, 1/3 as long as bell cavity; oral tentacles divided 5–7 times; gonads adradial, ribbon-like, with curtain-like folds, extending on the upper 2/3 of the distance from manubrium to bell margin. Each marginal bulb cleft, with about 14–18 tentacles; adaxial ocelli, large, dark.

L. AGASSIZ 1849, p. 289, 1 fig.: *Nemopsis bachei* n.g., n.sp. MAYER 1910, p. 173, Pl. 17, figs. 5, 6: *N. bachei*, = *N. gibbesii* McCrady 1857, *Favonia bachei* Haeckel 1877, *N. heteronema* Haeckel 1879; from Cape Cod to Florida, east coast of U.S.A. HARTLAUB 1911, p. 194, fig. 172: ? = *Hippocrene crucifera* Forbes & Goodsir 1853; non = *N. heteronema* Haeckel 1879. European localities: Zuidersee, Holland; (Scotland). BIGELOW 1914*b*, p. 9: New England. VAN KAMPEN 1922, p. 211: Zuidersee, Holland. FISH 1926, p. 124: Woods Hole, east coast of U.S.A. COWLES 1930, pp. 330–1: Chesapeake Bay, east coast of U.S.A. HUMMELINCK 1954, p. 165: no longer occurring in Zuidersee, Holland. TIFFON 1957, pp. 550–3, text-fig. 1: estuary of Gironde, France. KRAMP 1959*a*, pp. 111, 211, 214, 215, 217, 222, 223, 231, 265, fig. 97: diagnosis; distribution.

Nemopsis crucifera (Forbes & Goodsir 1853)

4 mm high and wide, globular. Stomach cruciform, half-way down radial canals, gonads curtain-like; oral tentacles divided twice. 6–8 tentacles in each cluster, the median pair of club-shaped tentacles not observed.

FORBES & GOODSIR 1853, p. 313, Pl. 10, fig. 5: as *Hippocrene crucifera* n.sp; west coast of Scotland. HAECKEL 1880, p. 635: *Nemopsis crucifera*. MAYER 1910, p. 174. HARTLAUB 1911, p. 195: identical with *N. bachei*? MARSHALL 1925, p. 127: Clyde Sea, Scotland. KRAMP 1959*a*, p. 111.

Nemopsis dofleini Maas 1909

13 mm high, 10 mm wide, very thick. Manubrium short and small, oral tentacles divided more than eight times; gonads along less than half of radial canals, ribbon-like and folded. Radial canals broad and jagged. About 40 tentacles in each group.

Maas 1909, p. 11, Pl. 1, figs. 4, 5: *Nemopsis dofleini* n.sp.; Japan. Kishinouye 1910, p. 26, Pl. 5, fig. 25: as *Favonia nipponica* n.sp.; Pl. 5, fig. 26: as *F. sulcata* n.sp.; Japan; Korsakoff Islands, Manchuria. Mayer 1910, p. 723: *N. dofleini*, = *F. nipponica*, ? = *F. sulcata*. Hartlaub 1911, p. 199, figs. 177, 178. Uchida 1925*b*, p. 85, fig. 11: Japan. Uchida 1927*a*, p. 223, fig. 41: *N. dofleini*, = *F. nipponica* + *sulcata* Kishinouye 1910; Japan. Uchida 1930, p. 334: examination of Maas's type-specimen. Thiel 1932*a*, p. 133. Thiel 1932*b*, pp. 440 ff.: distribution. Uchida 1938*c*, p. 50: Japan. Uchida 1940*a*, p. 287: Japan. Uchida 1958, p. 164: Sado, Japan. Yamazi 1958, p. 135: Tanabe Bay, Japan.

Nemopsis heteronema Haeckel 1879

12 mm high, 10 mm wide; globular. Stomach cubical; gonads extending to bell margin; oral tentacles divided 6–8 times. 10 tentacles (2+8) in each group. Ocelli are said to be abaxial.

Haeckel 1879, p. 93, Pl. 5, figs. 6–9: *Nemopsis heteronema* n.sp.; Norway. Mayer 1910, p. 173: = *N. bachei*. Hartlaub 1911, p. 197, fig. 174. Kramp 1926*a*, p. 48: Steenstrup's specimen from Iceland = *Bougainvillia principis*. Thiel 1932*a*, p. 133. Thiel 1932*b*, p. 462. Kramp 1939*a*, p. 6. Kramp 1959*a*, p. 111: probably = *N. bachei*.

Nemopsis sp.

Ganapati & Nagabhushanam 1958, pp. 92, 94: Vizagapatam coast, India.

Genus ***Thamnostoma*** Haeckel 1879

Bougainvilliidae with four or eight (or more) marginal tentacles and four branched oral tentacles above the mouth; with or without ocelli. Gonads interradial.

Type-species: *T. dibalium* (Busch 1851).

Péron & Lesueur 1809, p. 329: *Lymnorea* n.g. Haeckel 1879, pp. 84–6: *Thamnitis* n.g., *Thamnostoma* n.g. Mayer 1910, p. 152: *Thamnitis*; p. 153: *Lymnorea*, = *Limnorea* + *Thamnostoma* Haeckel 1879. Rees 1938, pp. 22–5: *Thamnostoma*, = *Thamnostoma* Haeckel 1879 + *Thamnitis* Haeckel 1879. *Lymnorea* must be omitted, the only species *L. triedra* being unrecognizable.

?*Thamnostoma alexandri* (Mayer 1904)

4 mm high, 3 mm wide, with vertical sides and flat apex. Manubrium half as long as bell cavity; oral tentacles divided three times. Ring canal slightly swollen in mid-region, with gland-cells. 32 tentacles with adaxial ocelli. Should possibly be in genus *Podocoryne*.

MAYER 1904, p. 10, Pl. 1, figs. 1–5*a*: as *Lymnorea alexandri* n.sp; Florida. MAYER 1910, pp. 154, 492, Pl. 15, figs. 4–9: as *L. alexandri*; Pacific coast of Mexico. FOERSTER 1923, p. 245.

Thamnostoma dibalium (Busch 1851)

7 mm high, 6 mm wide, oval. Stomach cubical, no peduncle, mouth tube as long as stomach; four oral tentacles divided two or three times. Four long perradial and four shorter interradial tentacles, with ocelli.

BUSCH 1851, p. 23, Pl. 1, figs. 7–9: as *Lizzia dibalia* n.sp.; Adriatic Sea. HAECKEL 1879, p. 86: *Thamnostoma dibolia* n.g., MAYER 1910, p. 153: as *Lymnorea dibalia.* HARTLAUB 1911, p. 226: ought not to be referred to *Lymnorea.* NEPPI & STIASNY 1913*b*, p. 49, Pl. 2, fig. 15: Trieste. PELL 1938, p. 924: Adriatic Sea. REES 1938, p. 25: as *T. dibolia.* RUSSELL 1953, p. 152: on spelling of the name. KRAMP 1959*a*, pp. 106, 223, fig. 82: diagnosis; distribution.

Thamnostoma macrostomum Haeckel 1879

8 mm high and wide, cubical. Stomach globular, no peduncle; mouth tube three times as long as stomach, extends beyond velar opening; four oral tentacles divided 6–8 times; four gonads. Eight similar tentacles with ocelli.

HAECKEL 1879, p. 86: *Thamnostoma macrostoma* n.g., n.sp.: Singapore, Indian Ocean. MAYER 1910, p. 153: as *Lymnorea macrostoma.* HARTLAUB 1911, p. 226: *Thamnostoma macrostoma.* REES 1938, p. 25.

Thamnostoma russelli Rees 1938

1·2–1·6 mm high, 1·2–1·35 mm wide (newly liberated), bell-shaped, thin, with a slight apical projection. Stomach short, cylindrical, oral tentacles divided once. Four perradial tentacles and four interradial bulbs with developing tentacles; no ocelli.

REES 1938, p. 22, fig. 7: *Thamnostoma russelli* n.sp.; hydroid and newly liberated medusa; Herdlafjord, Norway. REES 1953*a*, p. 8: Herdlafjord, Norway. RUSSELL 1953, p. 151, text-fig. 73C–E. KRAMP 1959*a*, pp. 106, 215, 218, 222, fig. 83: diagnosis; distribution.

Thamnostoma tetrellum (Haeckel 1879)

6 mm high, 4 mm wide, egg-shaped. Manubrium cubical with wide quadratic base; oral tentacles divided three times. Four tentacles, with ocelli.

HAECKEL 1879, p. 84: as *Thamnitis tetrella* n.g., n.sp.; Brazil. MAYER 1910, p.152: as *Thamnitis tetrella.* REES 1938, p. 25: *Thamnostoma tetrella.* VANNUCCI 1951, p. 152. KRAMP 1959*a*, pp. 106, 232, 233: diagnosis; distribution.

?*Thamnostoma* sp. (Neppi & Stiasny 1911, 1913)

3 mm high, 5 mm wide. Stomach four-sided, pyramidal, up to 1/3 as long

as bell height; four oral tentacles, short, contracted, divided twice; 16 short tentacles.

Neppi & Stiasny 1911, p. 396: as *Lymnorea* sp.; Trieste. Neppi & Stiasny 1913*b*, p. 50, Pl. 2, fig. 16: as *Lymnorea* sp.; Trieste.

Thamnostoma sp. Russell 1953

1–1·5 mm high and wide. Stomach elongated conical, half as long as bell cavity; gonads not developed; oral tentacles divided two or three times. Four marginal tentacles; no ocelli.

Russell 1953, p. 150, fig. 73A–B: *Thamnostoma* sp.; Firth of Clyde, Scotland. Kramp 1959*a*, p. 107, fig. 84.

Family *PANDEIDAE*

Anthomedusae with umbrella with or without an apical projection; large stomach usually without a peduncle; mouth with four simple or crenulated lips; with four (rarely eight) radial canals, rarely with centripetal canals; with simple or folded gonads situated adradially or interradially on stomach walls, sometimes extending along radial canals; with hollow marginal tentacles with tapering, conical basal bulbs, often laterally compressed; tentacles without terminal nematocyst knob; with or without rudimentary tentacles, warts or tentaculae; with or without abaxial ocelli. Hydroids with a single whorl of filiform tentacles.

Genus ***Amphinema*** Haeckel 1879

Pandeidae with two opposite, perradial tentacles; usually with an apical projection; without a gastric peduncle; stomach with broad base, sessile; with or without mesenteries. Gonads in adradial or interradial rows or extending along radial canals; with rudimentary tentaculae or marginal swellings; with or without ocelli.

Type-species: *A. dinema* (Péron & Lesueur).

L. Agassiz 1862, p. 347: as *Stomotoca*, including the species: *atra* L. Agassiz, *dinema* Pér. et Les. and *apicata* McCrady. Haeckel 1879, pp. 49, 51: *Stomotoca* is divided into *Amphinema* (with the species *apicatum* and *titania* n.sp.(=*dinema*)) and *Stomotoca* (with the species *atra* and *pterophylla* n.sp). Bigelow 1909*a*, p. 198: *Amphinema* + *Stomotoca*, belongs to family *Amphinemidae* Vanhöffen 1889. Mayer 1910, pp. 108, 490: *Stomotoca* = *Amphinema* + *Stomotoca*. Hartlaub 1913, p. 257: *Amphinema*. Vanhöffen 1913*b*, pp. 14–16: all three species are identical. Bigelow 1918, p. 370: new definition: to *Stomotoca* only species with peduncle. Uchida 1927*a*, p. 201: diagnoses of genera; *Amphinema* = *Stomotoca*. Russell 1953, p. 179: discussion of genus.

Amphinema australis (Mayer 1900)

3 mm high, 2·5 mm wide; with well developed, sharp-pointed apical projection. Manubrium urn-shaped, wide; four recurved lips; no mesenteries;

gonads interradial, complexly folded. Two opposite tentacles, each with an orange, abaxial ocellus, also 4–6 rudimentary bulbs (one or two in each quadrant) with ocelli.

MAYER 1900*b*, p. 32, Pl. 1, fig. 2: as *Stomotoca australis* n.sp.; Tortugas, Florida. BIGELOW 1909*a*, p. 199, Pl. 7, fig. 5, Pl. 38, figs. 10, 11: *Amphinema australis*; Acapulco Harbour, Pacific coast of Mexico. MAYER 1910, p. 111, Pl. 11, figs. 5, 6: as *S. octaëdra*; Bahamas; p. 490: does not accept Bigelow's statements. HARTLAUB 1913, p. 258: *Amphinema australis*, non = *S. octaëdra*. FOERSTER 1923, p. 239. KRAMP 1959*a*, pp. 118, 231, 270, fig. 111: not identical with *Codonorchis octaëdrus* Haeckel; diagnosis; distribution.

Amphinema dinema (Péron & Lesueur 1809)

Up to 6 mm high and 4 mm wide, with large conical apical projection. Stomach cross-like in section, flask-shaped, almost as long as bell cavity; four prominent, recurved lips; no mesenteries; gonads simple, adradial. Two long tentacles with large, elongated conical basal bulbs; 14–24 small marginal warts; no ocelli.

PÉRON & LESUEUR 1809, p. 346: as *Oceania dinema* n.sp. MAYER 1910, p. 109, Pl. 9, figs. 8–10, Pl. 10, figs. 1–4: as *Stomotoca dinema*. (British coasts) Cornwall, England (new record); from Cape Cod to Tortugas, Florida. NEPPI & STIASNY 1911, p. 398: as *S. dinema*; Trieste. NEPPI 1912, p. 720: as *S. dinema*; Dalmatia. NEPPI & STIASNY 1913*b*, p. 40, Pl. 1, fig. 8: as *S. dinema*; Trieste. VANHÖFFEN 1913*a*, p. 416: as *S. apicata*, = *S. rugosa* Mayer, but prefers the older name *apicata* McCrady. BIGELOW 1914*b*, p. 10: as *Amphinema apicata*, probably = *A. dinema*; Newport, Rhode Island, U.S.A. HARTLAUB 1913, p. 253, fig. 209: as *Tiarula tergestina*; Heligoland, North Sea; p. 259: *A. apicatum* ? = *A. dinema*; p. 261, fig. 215: as *Tiarula coeca* n.sp.; Heligoland. INT. PLANKT. CATAL. III 1916, p. 42: Irish Sea. LEBOUR 1916*a*, p. 51: as *S. dinema*, with larvae of *Anaphia petiolata*; Plymouth. LEBOUR 1917, p. 161: as *S. dinema*; Plymouth. LEBOUR 1922, p. 661: as *S. dinema*; food. LEBOUR 1923, p. 84, fig. 3*d*: as *S. dinema*; food. FISH 1926, pp. 123, 125: as *S. apicata*; Woods Hole. MAR. BIOL. ASS. 1931, p. 81: Plymouth. MENON 1931, p. 502: Madras, India. ?MENON 1932, p. 8, Pl. 1, fig. 7: Madras, India. KRAMP 1937*b*, p. 62. REES & RUSSELL 1937, pp. 62–6, figs. 1–4: rearing of the hydroid (a *Perigonimus*); Plymouth. RUSSELL 1938*b*, pp. 413, 416, 419, 420, 436: Plymouth. RUSSELL 1938*d*, p. 153, figs. 37–40: nematocysts. BABNIK 1948, p. 20: as *S. dinema*; p. 71: biological remarks; p. 21: as *Neoturris coeca*; Adriatic Sea. FRANC 1951, p. 27: St Malo, Channel. NAIR 1951, p. 52: *A. rugosa* Mayer = a young specimen of *A. dinema*; Trivandrum coast, India. KRAMP 1953, p. 265: *S. apicata* Mayer 1910 = *A. dinema*; N.E. Australia. RUSSELL 1953, p. 180, Pl. 10, figs. 1, 2, 4, Pl. 11, figs. 1, 3, text-fig. 89: states that *Tiarula coeca* = *A. dinema*; British coasts. KRAMP 1955*a*, p. 249: Gold Coast, Africa. NAUMOV 1956*a*, pp. 558–61, fig. 2*a*. VANNUCCI 1957*d*, pp. 37, 55, 90, 97, 99, 102: as *S. dinema*; Brazil. GANAPATI & NAGABHUSHANAM 1958, pp. 92, 94: Vizagapatam coast, India. KRAMP 1959*a*, pp. 117, 211, 214, 215, 217, 218, 223, 227, 231, 271, fig. 109: diagnosis; distribution; (fig. 107 erroneously as *Merga tergestina*).

Amphinema krampi Russell 1956

6 mm high, 4 mm wide, bell-shaped, no apical projection. Stomach cross-

shaped in section, 2/3 as long as bell cavity; four simple lips; long mesenteries; gonads four interradial, simple cushions. Two tentacles with swollen, elongated basal bulbs; six marginal tentaculae; no ocelli. About 12 strands of cellular tissue from each radial canal to the exumbrella surface.

Russell 1956*c*, pp 371–3, figs. 1, 2: *Amphinema krampi* n.sp; off mouth of English Channel. Russell 1958, pp. 81–4, figs. 1–3: further description. Kramp 1959*a*, pp. 118, 239, 240, fig. 113: diagnosis; distribution.

Amphinema physophorum (Uchida 1927)

2 mm high, 1·8 mm wide; with broad, pointed apex. Manubrium large, flask-shaped, cruciform; four recurved lips; no mesenteries; gonads eight adradial, transversely folded. Radial canals and ring canal broad and jagged. Two large tentacles and 14 rudimentary, very short and solid tentaculae. Inside base of large tentacles a transparent, jelly-like, accessory bulb. No ocelli.

Uchida 1927*a*, p. 202, Pl. 10, fig. 6: as *Stomotoca physophora* n.sp.; Japan. Ling 1937, p. 352, fig. 1: as *S. physophora*; Chekiang coast, China. Chiu 1954*b*, p. 49: as *S. physophora*; China.

Amphinema rubrum (Kramp 1957)

7 mm high, 4·5 mm wide, with fairly thick walls and a pointed apical projection. Stomach large, barrel-shaped; mesenteries long; mouth ?; gonads completely covering interradial walls of stomach; a broad, conical apical chamber above stomach. Two opposite tentacles with large, conical bulbs, ocelli not observed. Two perradial and four interradial, tenon-like tentaculae. Stomach deep reddish-brown.

Kramp 1957*a*, p. 14, Pl. 2, fig. 4: as *Merga rubra* n.sp; north of South Orkney Islands, Antarctic. Kramp 1959*a*, pp. 118, 239, 240, fig. 114: referred to *Amphinema*; diagnosis; distribution.

Amphinema rugosum (Mayer 1900)

5 mm high, 3 mm wide, with solid, elongated-conical or hemispherical apical projection. Stomach cross-like in section, flask-shaped, almost as long as bell cavity; no mesenteries; four prominent, recurved lips; gonads adradial, with 3–4 oblique folds. Two long tentacles with large, elongated conical basal bulbs; 16–24 small, solid tentaculae; no ocelli.

Mayer 1900*a*, p. 4, Pl. 2, fig. 5: as *Stomotoca rugosa* n.sp., = *S. apicata* Fewkes 1881, *Amphinema apicatum* Brooks 1883; Newport, Rhode Island; S. Carolina; Tortugas, Florida. Mayer 1910, p. 112, Pl. 10, figs. 5, 6, Pl. 11, figs. 1, 2: as *S. rugosa*. Hartlaub 1913, p. 258: *A. rugosa* (Mayer) possibly = *A. dinema*; p. 259, text-figs. 214, 216, 217: as *A. dinema*. Le Danois 1913*b*, p. 18, text-fig. 5: as *Saphenia dinema*; Little Minch, west coast of Scotland. Le Danois 1913*c*, p. 352: as *Saphenia dinema*. Bigelow 1914*b*, p. 10: *Amphinema rugosa*; Newport, New England.

Russell 1925, p. 781: as *Stomotoca dinema*; Plymouth. ?Kramp 1926*a*, p. 70: as *A. dinema*; from Shetland Islands to Norway. Russell 1927, p. 569: as *Stomotoca dinema*; Plymouth. Uchida 1927*a*, p. 202, text-fig. 32: as *Stomotoca rugosa*; Japan. ?Kramp 1930, p. 16: as *A. dinema*; S.W. North Sea; Dover Strait. Mar. Biol. Ass. 1931, p. 81: Plymouth. Russell 1931*b*, tab. I: as *A. dinema*; Plymouth. Russell 1933, tab. I: as *A. dinema*; Plymouth. Kramp 1937*b*, p. 62. Rees & Russell 1937, p. 67, text-figs. 5, 6: rearing of the hydroid, a *Perigonimus*; Plymouth. Russell 1938*b*, pp. 413, 416, 417, 419, 420, 423, 436: Plymouth. Russell 1938*d*, p. 154: nematocysts. Uchida 1938*a*, p. 144: as *Stomotoca rugosa*; Japan. Russell 1953, p. 183, Pl. 10, fig. 3, Pl. 11, figs. 2, 4, text-fig. 90 A, B: British coasts. Chow & Huang 1958, pp. 178, 189, Pl. 2, fig. 16: as *A. rugosum* var. *shantungensis* nov. var.; Chefoo, China. Yamazi 1958, p. 136: as *Stomotoca rugosa*; Tanabe Bay, Japan. Kramp 1959*a*, pp. 13, 117, 211, 214, 215, 216, 218, 223, 231, 271, fig. 110: Caribbean Sea; diagnosis; distribution.

Amphinema turrida (Mayer 1900)

4–7 mm high, somewhat higher than wide, with a conical, hollow apical projection. Stomach pyriform, almost as long as bell cavity; four large, recurved, crinkled lips; no mesenteries. Gonads sac-like, folded, extending from adradial sides of stomach outwards along 3/4 length of the radial canals. Two long tentacles with elongated, conical basal bulbs and 14 small, solid tentaculae, all with a red ocellus.

Mayer 1900*b*, p. 44, Pl. 2, figs. 3, 4: as *Dissonema turrida* n.sp.; Tortugas, Florida. Bigelow 1909*a*, p. 200, Pl. 7, fig. 2, Pl. 40, fig. 6, Pl. 43, fig. 3, Pl. 44, figs. 3, 4: *Amphinema turrida*; Acapulco Harbour, Mexico. Mayer 1910, p. 116, Pl. 10, fig. 1, Pl. 22, fig. 1: as *D. turrida*; Bahamas; p. 490: agrees with Bigelow, that *Dissonema* = *Amphinema*. Hartlaub 1913, p. 257, fig. 213: as *D. turrida*, non *Amphinema*. Vanhöffen 1913*a*, p. 417: as *D. turrida*; Tortugas, Florida. Mayer 1915*a*, p. 199, Pl. 1, fig. 1: as *Stomotoca turrida*; Torres Straits, Australia. Foerster 1923, p. 239. Uchida 1938*a*, p. 144: Japan. Kramp 1959*a*, pp. 118, 231, 270, fig. 112: diagnosis; distribution.

Amphinema sp. Browne 1916

2 mm high and wide; ? a small apical projection. Manubrium 1½ as long as bell cavity; four small lips; gonads eight adradial, folded bands in upper half of manubrium, with few large eggs. Two large opposite tentacles; 10 small rudimentary bulbs; no ocelli.

Browne 1916*a*, p. 181: *Amphinema* sp.; Amirante Islands.

Genus ***Annatiara*** Russell 1940

Pandeidae with several tentacles of two sizes, regularly alternating; manubrium short and broad, cruciform, the four large lobes closely connected with the proximal half part of the four radial canals; gonads interradial, with several folds; mouth very broad, cruciform, with folded rim.

Type-species: *A. affinis* (Hartlaub).

Hartlaub 1913, p. 269: as *Tiaranna*, in part. Russell 1940*a*, p. 518: *Annatiara* n.g.

Annatiara affinis (Hartlaub 1913)

12 mm high, 14–15 mm wide, dome-shaped, no apical projection Manubrium very broad, cruciform, its four perradial lobes in their entire length closely connected with the radial canals; mouth very wide, cruciform, with folded margin; gonads in irregular, vertical folds. About 32 primary tentacles with laterally compressed basal bulbs, alternating with minute ones (?rudimentary). No ocelli.

HARTLAUB 1913, p. 269, figs. 220–1: as *Tiaranna affinis* n.sp.; S.W. of Ireland. KRAMP 1920*a*, p. 6, Pl. 1, fig. 1: as *T. affinis*; S.W. of Ireland. KRAMP 1926*a*, p. 68, Pl. 1, figs. 15–17: as *T. affinis*; between Faroes and Rockall Bank. RANSON 1934*d*, pp. 436–42: as *T. affinis*; description and systematic position; all localities and a new: Bay of Biscay. RUSSELL 1940*a*, p. 518: belongs to the new genus *Annatiara*. RUSSELL 1953, p. 200, figs. 101–3. KRAMP 1955*a*, p. 251, fig. 3: off Liberia, W. Africa. KRAMP 1957*a*, pp. 15, 99, 126: tropical Atlantic Ocean; S. Africa. KRAMP 1957*b*, pp. 155, 162: Indian Ocean. PETERSEN 1957, p. 29: S.W. of Ireland. KRAMP 1959*a*, pp. 14, 121, 253, 256, 260, 263, fig. 123: off the English Channel; Bay of Biscay; eastern tropical Atlantic; Sargasso Sea; diagnosis; distribution.

Genus **Catablema** Haeckel 1879

Pandeidae with large apical projection; with numerous tentacles; no stomachal peduncle. Stomach large, with broad base, with four short mesenteries; mouth-rim with four large, crenulated lips. Radial canals broad, denticulated. Gonads broadly separated in perradials, reticular, with irregular folds issuing from the perradial sides.

Type-species: *C. vesicarium* (A. Agassiz).

HAECKEL 1879, p. 62: *Catablema* n.g. MAYER 1910, p. 120: as *Turris*, in part. HARTLAUB 1913, p. 312. RANSON 1936*b*, p. 79: discussion.

Catablema multicirratum Kishinouye 1910

Up to 35 mm wide and 30 mm high with large apical projection. Gonads predominantly in vertical folds, faintly reticulate; free portions of radial canals very broad and short. 100–155 tentacles.

KISHINOUYE 1910, p. 24: *Catablema multicirrata* n.sp.; Kuriles, Japan. BIGELOW 1913, p. 19, Pl. 1, figs. 4–7: Orca, Prince William Sound, Alaska; Dutch Harbour, Unalaska Island. HARTLAUB 1913, p. 321, figs. 268, 269. KRAMP 1913*a*, p. 267: as *C. eurystoma* in part; W. Greenland. KRAMP 1914, pp. 414, 416: as *C. eurystoma*. FOERSTER 1923, p. 242. KRAMP 1926*a*, p. 91, Pl. 2, fig. 12: S.W. Greenland. UCHIDA 1927*a*, p. 213: Japan. UCHIDA 1930, p. 331: Mutsu Bay, Japan. THIEL 1932*a*, p. 136. THIEL 1932*b*, pp. 441 ff.: distribution. UCHIDA 1933*a*, p. 130, fig. 6: S.W. Kamchatka. UCHIDA 1938*b*, p. 39: Japan. UCHIDA 1940*a*, p. 286: Japan. KRAMP 1942, p. 47: map of general distribution; W. Greenland. NAUMOV 1956*b*, p. 37. KRAMP 1959*a*, pp. 123, 208, 209, 269, fig. 126: diagnosis; distribution.

Catablema vesicarium (A. Agassiz 1862)

Up to about 25 mm wide and 30 mm high, including the large, globular apical projection. Gonads in irregular folds, oblique in lateral parts, almost perpendicular in middle part of each gonad, with densely reticulate surfaces; free portion of radial canals comparatively long. About 32 tentacles.

A. AGASSIZ 1862, p. 97: as *Turris vesicaria* n.sp. HAECKEL 1879, pp. 63, 64: *Catablema vesicarium* *campanula* n.sp. *eurystoma* n.sp. MAYER 1910, p. 126, Pl. 12, figs. 2, 3, Pl. 13, fig. 7: as *T. vesicaria*; S. of Cape Cod; Eastport, Maine; (Bear Island; Greenland; Spitzbergen); p. 128: as *T. campanula* and *eurystoma*; (Spitzbergen; Barents Sea; Greenland). BIGELOW 1913, p. 17, Pl. 1, figs. 8, 9: *C. vesicaria* var. *nodulosa* nov. var.; Dutch Harbour, Unalaska Island. HARTLAUB 1913, p. 315, figs. 263–7: *C. vesicarium* *C. campanula* *eurystoma* Haeckel; p. 321: *C. vesicaria* var. *nodulosa* not different from the typical *C. vesicarium*. KRAMP 1913*a*, p. 267: as *C. campanula* *eurystoma*; W. Greenland. BIGELOW 1914*b*, p. 11: New England, U.S.A. KRAMP 1914, pp. 414–16: as *C. campanula* *vesicaria* - *eurystoma*; W. Greenland. BIGELOW 1917, p. 303: off Halifax, Nova Scotia. BIGELOW 1920, p. 17: Black Tickle, Labrador. FOERSTER 1923, p. 242: Vancouver; Bering Sea (report). KRAMP & DAMAS 1925, p. 281: Norway; Spitzbergen; northern Iceland. KRAMP 1926*a*, p. 87, Pl. 2, figs. 10, 11: map of distribution; W. Greenland; northern Iceland. THIEL 1932*b*, p. 136. THIEL 1932*b*, pp. 441 ff.: distribution. KRAMP 1933*b*, p. 16: Angmagssalik, E. Greenland. BERNSTEIN 1934, pp. 9, 24: Kara Sea. RANSON 1936*b*, p. 80: Spitzbergen. YASHNOV 1939, p. 112: Kara Sea. KRAMP 1939*a*, p. 9: Iceland. DUNBAR 1942, p. 74: as *C. vesicaria*; eastern arctic Canada. KRAMP 1942, p. 42: W. Greenland. KRAMP 1943, p. 6: E. Greenland. YASHNOV 1948, p. 71, Pl. 19, fig. 6: Barents Sea; White Sea; Kara Sea; Bering Sea. KRAMP 1955*b*, pp. 152, 153: by Haeckel 1879 determined as *Tiara conifera*, *C. campanula* and *eurystoma*. NAUMOV 1956*b*, p. 37. PETERSEN 1957, p. 27: south of Cape Farewell, Greenland. KRAMP 1959*a*, pp. 122, 208–12, 215, 220, 221, 269, fig. 125: diagnosis; distribution.

Genus ***Cirrhitiara*** Hartlaub 1913

Pandeidae with four or eight large tentacles and a number of rudimentary marginal bulbs each of which carries a lateral cirrus; all marginal bulbs with ocelli. Gonads of *Leuckartiara* type; long mesenteries. Large, gelatinous apical projection.

Type-species: *C. superba* (Mayer).

MAYER 1900*b*, p. 34: as *Tiara*. MAYER 1910, p. 126: as *Turris*. HARTLAUB 1913, p. 284: *Cirrhitiara* n.g.

Cirrhitiara superba (Mayer 1900)

5–7 mm high; with a well developed apical projection. Manubrium wide; four recurved, folded lips; gonads interradial, horse-shoe-shaped, with diverticulae directed outwards and upwards towards the perradii. Four broad, flat, smooth-edged radial canals, entering stomach by four wide, funnel-like openings. Four long tentacles; 12 small rudimentary bulbs, each with a small, solid cirrus; all marginal bulbs with an abaxial ocellus.

MAYER 1900*b*, p. 34, Pl. 16, fig. 39: as *Tiara superba* n.sp; Tortugas, Florida. MAYER 1910, p. 126, Pl. 27, fig. 8, Pl. 28 figs. 3, 4: as *Turris pileata* var. *superba*;

Bahamas. HARTLAUB 1913, p. 284, fig. 237: *Cirrhitiara superba* n.g. VANHÖFFEN 1913*a*, p. 416: as *Tiara pileata* f. *superba*; Tortugas, Florida. THIEL 1938*c*, p. 296, fig. 2: coast of Brazil. KRAMP 1953, p. 267: N.E. Australia. KRAMP 1959*a*, pp. 121, 232, 233, 272, fig. 122: diagnosis; distribution. KRAMP 1959*c*, p. 236 comparison with *Leuckartiara hoepplii*.

Genus ***Cnidotiara*** Uchida 1927

Pandeidae with four radial canals and four perradial, hollow, club-shaped tentacles; manubrium flask-shaped, mouth simple; eight simple, adradial gonads. A globular nematocyst knob inside the base of each tentacle.

Type-species: *C. gotoi* Uchida.

UCHIDA 1927*a*, p. 204: *Cnidotiara* n.g.

Cnidotiara gotoi Uchida 1927

8 mm high, 4 mm wide, rigid, with a solid apical process 3 mm high. Manubrium broadly flask-shaped, without lips. Four tentacles, very short, rounded at end, with ocelli; a large, round knob with nematocysts inside the base of each tentacle.

UCHIDA 1927*a*, p. 204, fig. 33: *Cnidotiara gotoi* n.g., n.sp.; Seto Biol. Stat., Japan. KRAMP 1959*a*, pp. 12, 114, 231, 232, 272, Pl. 1, figs. 7, 8, text-fig. 102: between the Azores and east coast of U.S.A.; diagnosis; distribution.

Genus ***Codonorchis*** Haeckel 1879

Pandeidae with two opposite, perradial tentacles; without gastric peduncle and without mesenteries; gonads four flat, interradial lappets extending from the sides of the stomach outwards upon the subumbrella.

Type-species: *C. octaëdrus* Haeckel.

HAECKEL 1879, p. 51: *Codonorchis* n.g. MAYER 1910, p. 111: as *Stomotoca*.

Codonorchis octaedrus Haeckel 1879

2·5 mm wide, 4 mm high, with a high, cylindrical apical projection. Bell margin with two very long, opposite tentacles and 10 rudimentary marginal bulbs, with ocelli. Doubtful species.

HAECKEL 1879, p. 51: *Codonorchis octaëdrus* n.g., n.sp.; Atlantic coast of France. MAYER 1910, p. 111: as *Stomotoca octaëdra* in part. HARTLAUB 1913, p. 265. KRAMP 1959*a*, p. 124: diagnosis; distribution.

Genus ***Dissonema*** Haeckel 1879

Pandeidae with two opposite tentacles; without marginal clubs; cirri sometimes present; with abaxial ocelli. Gonads extend from the manubrium outwards along the radial canals.

Type-species: *D. saphenella* Haeckel.

HAECKEL 1879, p. 126: *Dissonema* n.g.

Dissonema gaussi Vanhöffen 1912

5 mm high and wide, with a pointed apical projection. Stomach broad, mouth crenulated; gonads folded. Four large perradial tentacles, in each quadrant four tentaculae. Doubtful species of doubtful affinity.

VANHÖFFEN 1912, p. 361, Pl. 24, fig. 2: Gauss Station, Antarctic; no description given but comparison with *Dissonema saphenella* and *Amphinema turrida*. HARTLAUB 1913, p. 257, note: doubtful species, probably not a *Dissonema*.

Dissonema saphenella Haeckel 1879

6 mm high, 4 mm wide, pyriform; thick, solid apex. Manubrium cylindrical, half as long as bell cavity, four short, crinkled lips; gonads almost to ring canal. Two very long tentacles with large, swollen, conical bulbs; two rudimentary bulbs; no clubs or cirri. Doubtful species.

HAECKEL 1879, p. 126, Pl. 8, fig. 3: *Dissonema saphenella* n.g., n.sp.; coast of Australia. MAYER 1910, p. 115, fig. 62.

Genus ***Endocrypta*** Fraser 1912

Medusae with four radial canals and four simple marginal tentacles; liberated from hydroid with claviform hydranths with scattered filiform tentacles.

Type-species: *E. huntsmani* (Fraser).

FRASER 1911, p. 19: as *Crypta* n.g. FRASER 1912, p. 216: *Endocrypta* n.g.

Endocrypta huntsmani (Fraser 1911)

Newly liberated medusa globular, about 2 mm wide, with an extensive velum. Hydroid in the branchial cavity of ascidians.

FRASER 1911, p. 19: as *Crypta huntsmani* n.g., n.sp. hydroid; San Juan Archipelago, W. coast of N. America. FRASER 1912, p. 216: *Endocrypta huntsmani* n.g. FRASER 1914, p. 109, Pl. 1, fig. 1: hydroid and newly hatched medusa; Vancouver. FOERSTER 1923, p. 21.

Genus ***Eutiara*** Bigelow 1918

Pandeidae with blind centripetal canals alternating with the radial canals; with well developed mesenteries; complex gonads fundamentally of the 'Neoturris' type.

Type-species: *E. mayeri* Bigelow.

BIGELOW 1918, p. 374: *Eutiara* n.g.

Eutiara mayeri Bigelow 1918

18 mm high, 14 mm wide; dome-shaped, thin walls, no apical projection. Eight radial exumbral ribs (hollow canals) from tentacle bulbs upwards, without nematocysts. Manubrium large, longer than half of bell cavity, connected with radial canals along almost whole length; gonads eight adradial series of folds. Radial canals broad, with branched lateral diverticula. Four interradial centripetal canals, with wavy margins. Eight tentacles and many small knobs.

BIGELOW 1918, p. 374, Pl. 1, figs. 1–5, Pl. 3, fig. 6: *Eutiara mayeri* n.g., n.sp.; Chesapeake Bay, U.S.A. RANSON 1936*b* pp. 40, 74, 75, 79, 90: as *Neoturris mayeri*. RANSON 1937, p. 326, fig. 3: as *Eutiara* (*Neoturris*) *mayeri*. KRAMP 1959*a*, pp. 14, 123, 232, fig. 129: Caribbean Sea; diagnosis; distribution.

Genus ***Halimedusa*** Bigelow 1916

Pandeidae with oral armature of sessile nematocyst knobs. Stomach with four radial extensions over a gelatinous gastric peduncle.

Type-species: *H. typus* Bigelow.

BIGELOW 1916, p. 91: *Halimedusa* n.g.

Halimedusa typus Bigelow 1916

16 mm high, 13 mm wide, walls thick, especially at apex. Manubrium on a broad, low peduncle, gastric part cruciform, its four radial folds clasp the peduncle; oral part also cruciform, mouth-rim studded with nematocyst knobs. Gonads cover gastric part of manubrium. Four perradial tentacles and four interradial groups of 10–11 tentacles in each; all with ocelli.

BIGELOW 1916, p. 91, Pl. 1, figs 1–9: *Halimedusa typus* n.g., n.sp.; discussion of systematic position; Vancouver Island. FOERSTER 1923, p. 239.

Genus ***Halitholus*** Hartlaub 1913

Pandeidae with large, dome-like apical projection. Manubrium cubical; gonads more or less horse-shoe-shaped, folded; mouth-rim faintly crenulated. Radial canals comparatively narrow, not or very slightly jagged; no mesenteries. Eight or more tentacles.

Type-species: *H. pauper* Hartlaub.

HARTLAUB 1913, p. 271: *Halitholus* n.g.

Halitholus cirratus Hartlaub 1913

16 mm high, 14 mm wide, with large, globular apical projection. Manubrium almost to velar level. About 40 tentacles; no ocelli.

MAYER 1910, p. 128: as *Tiara conifera*, in part. HARTLAUB 1913, p. 274: *Halitholus cirratus* n.sp., = *Tiara conifera* in part, non Haeckel; (Spitzbergen; Barents Sea); N. Kattegat; Baltic Sea. KRAMP 1913*a*, p. 266: as *Tiara conifera*; W. Greenland.

KRAMP 1914, p. 412: as *Tiara conifera* in part, W. Greenland. KRAMP 1915, p. 10: Great Belt and Kattegat, Denmark. HARTLAUB 1917, p. 409: remarks to Kramp 1913*a*. BIGELOW 1920, p. 6, Pl. 1, figs. 2, 3: northern Alaska. KRAMP 1926*a*, p. 74, Pl. 2, fig. 4: map; W. Greenland. KRAMP 1927, p. 87: Denmark. THIEL 1932*a*, p. 135. THIEL 1932*b*, pp. 440 ff.: distribution. KÜNNE 1935, p. 64: Baltic Sea. FROST 1937, p. 26: Newfoundland. KRAMP 1937*b*, p. 62, fig. 25: Denmark. KÜNNE 1937*b*, p. 6: Baltic Sea. YASHNOV 1939, pp. 112, 113: Laptev Sea; East Siberian Sea; Chukotsky Sea. DUNBAR 1942, p. 74: eastern arctic Canada. KRAMP 1942, p. 40: W. Greenland. KRAMP 1943, p. 6: E. Greenland. YASHNOV 1946, pp. 41, 45, 46, 49, fig. 2, map: arctic sea north of Siberia. YASHNOV 1948, p. 70, Pl. 19, fig. 5: White Sea; Laptev Sea; East Siberian Sea; Chukotsky Sea. KÄNDLER 1950, p. 68: Fehmarnbelt, Baltic Sea. MACGINITIE 1955, pp. 100, 118: Point Barrow, Alaska. NAUMOV 1956*a*, pp. 558–61, fig. 2*b*. NAUMOV 1956*b*, p. 37. PETERSEN 1957, p. 27: S.E. Greenland. SEGERSTRÅLE 1957, p. 783: Baltic Sea. GRAINGER 1959, pp. 470, 496: Iglooik, arctic Canada. KRAMP 1959*a*, pp. 119, 208–11, 215, 220, 266, 267, 269, fig. 117: diagnosis; distribution.

Halitholus intermedius (Browne 1902)

9–10 mm high, 7 mm wide, with large, conical apical projection. Manubrium 1/2–2/3 of the length of the bell cavity; interradial horse-shoe fold merely indicated. Four large perradial and four smaller interradial tentacles, eight adradial bulbs, all with conspicuous ocelli; also a variable number of minute bulbs.

BROWNE 1902, p. 277: as *Tiara intermedia* n.sp; Falkland Islands. MAYER 1910, p. 123: *T. intermedia* ? = *Turris pileata*; p. 125: ? = *Turris papua*. HARTLAUB 1913, pp. 286, 292: considered to be = *Leuckartiara octona*. BROWNE & KRAMP 1939, p. 288, Pl. 14, fig. 7, Pl. 16, figs. 1, 2: *Halitholus intermedius*; new description; Falkland Islands. KRAMP 1957*a*, pp. 15, 96, 97, 105, 124: S. Africa. KRAMP 1959*a*, pp. 119, 227, 230, 235, 237, 267, fig. 118: diagnosis; distribution.

Halitholus pauper Hartlaub 1913

10 mm high, 9 mm wide, with low, rounded apical projection. Manubrium half as long as bell cavity; gonads with horse-shoe fold. Four large perradial and four small interradial tentacles, with small ocelli, and a few very small rudimentary bulbs.

MAYER 1910, p. 128: as *Tiara conifera*, in part. HARTLAUB 1913, p. 272: *Halitholus pauper* n.g., n.sp.; W. Greenland. KRAMP 1913*a*, p. 266: as *Tiara pileata* in part; p. 267: as *Catablema campanula* in part; W. Greenland. KRAMP 1914, p. 413: *Halitholus pauper*; p. 414: as *C. campanula* in part; W. Greenland. FOERSTER 1923, p. 240, Pl. 1, figs. 2, 3: Departure Bay, Vancouver. KRAMP 1926*a*, p. 71, Pl. 2, figs. 1–3, map: W. Greenland; Iceland. THIEL 1932*a*, p. 135. THIEL 1932*b*, pp. 440 ff.: distribution. ?UCHIDA 1933*a*, p. 128, figs. 4, 5: S.W. Kamchatka. KRAMP 1939*a*, p. 8: Iceland. UCHIDA 1940*a*, p. 285, fig. 4: Japan. DUNBAR 1942, p. 74: eastern arctic Canada. KRAMP 1942, p. 37: W. Greenland. KRAMP 1943, p. 5: E. Greenland. NAUMOV 1956*b*, p. 37. KRAMP 1959*a*, pp. 119, 208, 209, 215, 221, 269, fig. 116: diagnosis; distribution.

Genus ***Halitiara*** Fewkes 1882

Pandeidae with four straight radial canals; with four perradial tentacles and several intermediate solid, cirrus-like tentacles; mouth a simple, cruciform opening. No ocelli. Gonads interradial, not folded.

Type-species: *H. formosa* Fewkes.

FEWKES 1882*a*, p. 276: *Halitiara* n.g.

Halitiara formosa Fewkes 1882

About 3 mm high, pear-shaped with solid apical projection. Manubrium pyriform, about half as long as bell cavity; mouth a simple, cruciform opening. Four long, hollow and 24–35 short, solid tentacles, tightly coiled, cirrus-like; no ocelli. Gonads interradial; no mesenteries.

FEWKES 1882*a*, p. 276, Pl. 4, fig. 2: *Halitiara formosa* n.g., n.sp.; Tortugas, Florida. MAYER 1910, p. 107, Pl. 6, figs. 4–6, Pl. 13, figs. 1, 2: as *Protiara formosa*; Bahamas; ? Fiji Islands. HARTLAUB 1913, pp. 241, 249. BIGELOW 1919, p. 281: probably to Pandeidae. UCHIDA 1927*a*, p. 203: Japan. MENON 1932, p. 7, Pl. 1, fig. 4: Madras, India. YAMAZI 1958, p. 135: Tanabe Bay, Japan. KRAMP 1959*a*, pp. 115, 231, 270, fig. 103: diagnosis; distribution.

Genus ***Leuckartiara*** Hartlaub 1913

Pandeidae usually with an apical projection of varying shape; with large stomach attached to radial canals by mesenteries; mouth with much folded or crenulated lips; gonads interradial, horse-shoe-shaped with folds directed perradially; radial canals broad and ribbon-like, often with jagged edges; with numerous tentacles with elongated, laterally compressed basal bulbs; often with rudimentary tentacles.

Type-species: *L. octona* Fleming.

HARTLAUB 1913, p. 282: *Leuckartiara* nom. nov. = *Tiara* in part and *Turris* in part. BIGELOW 1919, p. 281: follows Hartlaub. KRAMP 1928, p. 56: Hartlaub is probably right, that *Tiara papua* Maas 1905, 1906*a* and 1909 and Bigelow 1909*a*, *Tiara oceanica* Agass. & Mayer 1902 and *Tiara intermedia* Browne 1902 belong to *Leuckartiara*. RANSON 1936*b*, p. 70: discussion of *Leuckartiara*.

Leuckartiara abyssi (G. O. Sars 1874)

Newly hatched medusa: globular, no apical projection. Four radial canals and ring canal fairly broad. Four perradial tentacles, of which two opposite are better developed than the other two. Hydroid: *Perigonimus abyssi* G. O. Sars.

G. O. SARS 1874, p. 126, Pl. 5, figs. 27–30: *Perigonimus abyssi* n.sp.; hydroid; Hvitingsö, Norway. REES 1938, p. 19, fig. 6: *Leuckartiara abyssi*; description of newly liberated medusa; Herdla, Bergen. RUSSELL 1953, pp. 188, 203, 486, text-fig. 98 (p. 197). KRAMP 1959*a*, p. 121: diagnosis.

Leuckartiara annexa Kramp 1957

11 mm high and 9 mm wide, dome-shaped, without apical projection, walls fairly thin. Stomach very large, in upper half connected with radial canals; gonads typical, on whole surface of stomach, the transverse bridge in middle part of stomach wall; radial canals with slightly undulated edges. Eight large tentacles with large, elongated bulbs, each with a short abaxial spur; also eight small adradial tentacles without basal swellings, their proximal part narrow, adnate to umbrella margin and continued upward on exumbrella, whence a short filiform tentacle projects upwards and outwards; moreover 16 minute rudimentary marginal bulbs.

KRAMP 1957*a*, pp. 16, 96, 105, Pl. 2, figs. 5, 6: *Leuckartiara annexa* n.sp.; off East Africa.

Leuckartiara breviconis (Murbach & Shearer 1902)

Up to 45 mm high and 35 mm wide; apical projection low and rounded. Manubrium broad, more than half as long as bell cavity; gonads horse-shoe-shaped with horizontal folds, usually only in upper half of manubrium. Radial canals jagged, ring canal broad, smooth. 100 or more tentacles, densely crowded, fully developed alternating with smaller ones; bulbs laterally compressed, grasping margin, but without a true spur; no ocelli.

MURBACH & SHEARER 1902, p. 73: as *Turris breviconis* n.sp.; St Paul Island, Alaska. MAYER 1910, p. 127: as *Turris breviconis*. HARTLAUB 1913, p. 304, figs. 254–6: *Leuckartiara brevicornis* (misprint); northern North Sea; (Alaska). KRAMP 1913*a*, p. 266: as *Tiara pileata* in part; W. Greenland. KRAMP 1914, p. 412: as *Tiara conifera* in part: W. Greenland. HARTLAUB 1917, p. 410: *L. brevicornis*; description of a specimen from W. Greenland (Kramp 1913*a*). FOERSTER 1923, p. 241, Pl. 2, figs. 1–3: localities in western N. America; Vancouver. KRAMP & DAMAS 1925, p. 277: Norway. KRAMP 1926*a*, p. 80, Pl. 2, fig. 8: map; British Isles; Iceland; S.W. Greenland. THIEL 1932*a*, p. 135: as *L. brevicornis*. THIEL 1932*b*, pp. 440 ff.: as *L. brevicornis*; distribution. UCHIDA 1938*c*, p. 49, fig. 1: as *L. brevicornis*; morphological remarks; Okati Bay, Japan. KRAMP 1939*a*, p. 8: Iceland. DUNBAR 1942, p. 74: *L. brevicornis*; Hudson Strait. KRAMP 1942, p. 42: W. Greenland. RUSSELL 1953, p. 198, Pl. 12, fig. 2, text-figs. 99, 100: British coasts. NAUMOV 1956*b*, p. 37. VANNUCCI 1956*b*, pp. 246, 247: Clyde Sea (erroneous). PETERSEN 1957, p. 27: west of Faroes. VANNUCCI 1957*b*, p. 281: correction of the above record from Clyde Sea. KRAMP 1959*a*, pp. 120, 208, 209, 210, 215, 216, 218, 220, 271, fig. 121: diagnosis; distribution.

Leuckartiara gardineri Browne 1916

6 mm high, 3·5 mm wide; conical, thin walls, conical apex. Exumbrella with four perradial canal-like bands nearly to summit. Manubrium nearly to velar level; mouth large, folded; gonads adradial, connected by bridge in middle. Four long tentacles and minute, thin inter- and adradial tentacles with ocelli.

BROWNE 1916*a*, p. 181, Pl. 39, fig. 4: *Leuckartiara gardineri* n.sp.; Amirante Islands, Indian Ocean. BIGELOW 1918, p. 375: the exumbrellar bands are perhaps actually canals. RANSON 1937, p. 327: ' cnidactines ' and ' cnidothylacies '. KRAMP 1953, p. 267: N.E. Australia.

Leuckartiara grimaldii Ranson 1936

16 mm high, 12 mm wide; bell-shaped, thin, no apical projection. Stomach very large, mesenteries along entire length of stomach, gonads not observed; mouth folded. Radial canals short, broad, slightly jagged. 24 tentacles and 32 small bulbs. Ocelli not seen.

RANSON 1936*b*, p. 78, Pl. 1, figs. 7, 8: *Leuckartiara grimaldii* n.sp.; Azores. KRAMP 1959*a*, pp. 120, 239, 240: diagnosis; distribution.

Leuckartiara hoepplii Hsu 1928

14–15 mm high, 7–8 mm wide; with large, globular apical projection, 7–8 mm high and wide. Stomach wide, lips complexly folded, crenulated and recurved. Eight well developed tentacles with abaxial spurs, without ocelli; about 24 very short, rudimentary tentacles with ocelli, and each with a small median cirrus.

BIGELOW 1919, p. 282, Pl. 39, figs. 5, 6: as *Leuckartiara octona*; Philippines. HSU 1928, pp. 1–7, figs. 1–4: *Leuckartiara hoepplii* n.sp.; Amoy, China. LING 1937, p. 353, fig. 2: as *L. octona* var. *minor* nov. var.; Chekiang coast, China. UCHIDA 1938*a*, p. 144: as *Cirrhitiara hoepplii*; Amakusa, Japan. CHIU 1954*a*, p. 41: Amoy, China. CHIU 1954*b*, pp. 49, 52: as *L. octona* var. *minor*; p. 50: as *L. hoepplii*; China. KRAMP 1958*b*, p. 342: the Nicobars, Indian Ocean. KRAMP 1959*c*, p. 235, fig. 9: description of an early stage; Philippines.

Leuckartiara nobilis Hartlaub 1913

Up to 27 mm high and 20 mm wide. Apical projection well developed. Manubrium larger than half size of bell cavity; gonads typical, covering whole walls of stomach; mesenteries along half part of stomach; lips complexly folded. Radial canals broad, with short lateral diverticula; ring canal narrow, smooth. About 24–40 tentacles of different size, none permanently rudimentary; spurs faintly developed; no club-shaped marginal rudiments. Ocelli dark red.

HARTLAUB 1913, p. 308, figs. 257–60: *Leuckartiara nobilis* n.sp., = *Tiara pileata* var. *coccinea* Hckl.; Mediterranean Sea; (Ireland). KRAMP 1920*b*, p. 3: northern Atlantic Ocean. FOERSTER 1923, p. 242, Pl. 1, fig. 6: Vancouver. KRAMP 1926*a*, p. 83, Pl. 2, text-fig. 9, fig. 36*a–e*, map: N.E. Atlantic Ocean. KRAMP 1927, p. 101: Great Belt, Denmark. RANSON 1936*b*, p. 77: Monaco. FROST 1937, p. 26: Newfoundland. KRAMP 1937*b*, p. 67, fig. 27*b*: Denmark. KRAMP 1947, p. 50: Atlantic Ocean between Newfoundland and British Channel. RUSSELL 1953, p. 195, Pl. 12, fig. 4, text-fig. 97: British coasts. KRAMP 1955*b*, p. 152: by Haeckel 1879 determined as *Oceania* sp. PETERSEN 1957, p. 27: S. of Iceland; between Iceland and Greenland; between Newfoundland and Greenland. KRAMP 1959*a*, pp. 120, 211, 212, 215, 216, 219, 221, 224, 271, fig. 120: diagnosis; distribution.

Leuckartiara octona (Fleming 1823)

Up to 20 mm high, higher than wide, with conical or spherical apical projection, lateral walls thin. Manubrium broad, of varying length; gonads typical, on whole surface of stomach; radial canals with smooth or slightly jagged edges. Tentacles 12–24, usually 16, each with a pronounced abaxial spur, and 16 or more rudiments which are club-shaped; tentacle bulbs and rudiments with red ocelli.

Fleming 1823, p. 299: as *Geryonia octona* n.sp. Mayer 1910, p. 123: as synonym of *Turris pileata*. Hartlaub 1913, p. 285, figs. 238–53: *Leuckartiara octona*, = *Tiara pileata* in part; list of synonyms; northern Atlantic Ocean; Mediterranean; (Pacific Ocean; Malayan Archipelago). Kramp 1913*a*, p. 266: as *Tiara pileata* in part; W. Greenland. Bigelow 1914*b*, p. 10: New England. Kramp 1914, p. 411: as *T. pileata* in part; W. Greenland. Lebour 1916*a*, p. 51: as *Turris pileata*, with larvae of *Anaphia petiolata*; Plymouth. Lebour 1916*b*, pp. 57–9: as *Turris pileata*, with cercariae of *Pharyngora bacillaris*; Plymouth. Bigelow 1917, p. 303: Gulf of Maine, U.S.A. Hartlaub 1917, p. 410: remarks to Kramp 1913*a* and Le Danois 1913*a*; Heligoland. Lebour 1917, p. 161: as *Turris pileata*; Plymouth. Pell 1918, pp. 22, 24: Adriatic Sea. Bigelow 1919, p. 282: acknowledges that *Tiara papua* Maas 1905 and 1909 and Bigelow 1909*a* = *L. octona* (non *Tiara papua* Lesson, = *Neoturris papua*); Philippines. Dick 1919, p. 91: Firth of Clyde. Kramp 1920*a*, p. 7: W. of Scotland. Kramp 1920*b*, p. 3: northern Atlantic Ocean. Sverdrup 1921, p. 21, Pl. 2, fig. 10: as *Perigonimus repens*; Kristianiafjord, Norway. Lebour 1922, pp. 655, 662, fig. 2: as *Turris pileata*; food. Elmhirst 1923, p. 20: *Perigonimus repens*, hydroid; medusae set free July to October; Clyde Sea. Foerster 1923, p. 240, Pl. 1, figs. 4, 5: Vancouver. Lebour 1923, p. 83, fig. 8: as *Turris pileata*; food. Peacock 1923, p. 94: as *Turris pileata* (*Oceania octona* Forbes); Cullercoats, England. Coy 1924, p. 55: as *Turris pileata*; Cullercoats. Kramp 1924, p. 6, map: Mediterranean. Peacock 1924, p. 58: as *Turris pileata*; Cullercoats. Kramp & Damas 1925, p. 277: Norway and N.W. Iceland. Marshall 1925, p. 127: Clyde Sea. ?Ranson 1925*a*, p. 89: as *Turris digitalis*; Bay of Biscay. Ranson 1925*c*, p. 459: as *Turris vesicaria*; St Waast, Channel. Russell 1925, p. 782: as *Turris pileata*; Plymouth. Kramp 1926*a*, p. 76, Pl. 2, figs. 5–7, text-fig. 35, map: N.E. Atlantic Ocean. Russell 1926, p. 434: as *Turris pileata*; Plymouth. Kramp 1927, p. 101, map: Denmark. Russell 1927, p. 571: as *Turris pileata*; Plymouth. Uchida 1927*a*, p. 211, fig. 37: *L. octona*, = *Tiara papua* Bigelow 1909, *Turris papua* Mayer 1910 in part, *Tiara papua* Maas 1909; Japan. Russell 1928, p. 85: as *Turris pileata*; Plymouth. Kramp 1930, p. 17: S.W. North Sea. Sanderson 1930, p. 226: Northumberland coast, England. ?Stiasny 1930*b*, p. 1: determination doubtful; Zuiderzee, Holland. Uchida 1930, p. 331: Mutsu Bay, Japan. Watson 1930, p. 237: Northumberland coast. Mar. Biol. Ass. 1931, p. 81: Plymouth. Russell 1931*b*, p. 771, Pl. 1: Plymouth. ?Menon 1932, p. 9, Pl. 1, fig. 5: Madras, India. Runnström 1932, p. 28: Herdla- and Hjeltefjord, Norway. Thiel 1932*a*, p. 136. Thiel 1932*b*, pp. 440 ff.: distribution. Russell 1933, Tab. 1, Plymouth. Ranson 1936*b*, p. 75: Toulon, Mediterranean. Kramp 1937*b*, p. 65, figs. 26, 27*a*: Denmark. Ling 1937, p. 353, fig. 2: *L. octona* var. *minor*, (according to Uchida 1938*a* = *L. hoepplii*); Chekiang coast, China. Moore 1937, p. 49: Port Erin, Isle of Man. Pell 1938, p. 922: Adriatic Sea. Rees 1938, p. 12, figs. 3–5: description of hydroid and discussion of nomenclature; Plymouth. Russell 1938*b*, pp. 413, 416, 419, 436: Plymouth. Russell 1938*d*, p. 154, figs. 41–4; nematocysts. Uchida 1938*b*, p. 39:

Japan. Hiro 1939, p. 170, figs. 3, 4: hydroid and young medusa; Japan. Kramp 1939*a*, p. 8: Iceland. Uchida 1940*a*, p. 285: Japan. Maaden 1942*a*, p. 354: Holland. Kramp 1947, p. 50: North Sea. Kramp 1948*b*, p. 20: S.W. of Iceland. Nair 1951, p. 52: believes that Menon's specimen (1932) and *L. octona* var. *minor* Ling 1937 are *L. octona*; Trivandrum coast, India. Künne 1952, pp. 10, 32, 39: S.E. North Sea. Kramp 1953, p. 267: N.E. Australia. Rees 1953*a*, p. 8: Herdlafjord, Norway. Russell 1953, p. 188, Pl. 11, figs. 5, 6, Pl. 12, fig. 3, Pl. 31, text-figs. 91, 92, 93A, B, 94, 95, 96: British coasts. Hummelinck 1954, p. 165: no longer occurring in Zuiderzee, Holland. Southward 1954, p. 18: Irish Sea. Chiu 1954*a*, pp. 41, 42, Pl. 8, fig. 25: Amoy, China. Chiu 1954*b*, pp. 50, 52: China. Kramp 1957*a*, pp. 15, 105, 124: eastern tropical Atlantic Ocean. Ganapati & Nagabhushanam 1958, pp. 92, 94: Vizagapatam coast, India. Yamazi 1958, p. 135: Tanabe Bay, Japan. Kramp 1959*a*, pp. 14, 120, 208–11, 215, 220, 223, 227, 271, fig. 119: Cape Verde, W. Africa; diagnosis; distribution. Werner 1959*a*, p. 33: Port Erin, Isle of Man.

Leuckartiara zacae Bigelow 1940

21 mm high, 18 mm wide. No distinct apical projection; exumbrella with longitudinal ribs above the tentacles. Manubrium larger than 2/3 of the length of bell cavity, mouth-rim complexly folded; gonads complexly folded. Four large perradial tentacles and in each quadrant 2–3 other well developed tentacles; 1–3 rudimentary knobs between the tentacles; all without ocelli.

Bigelow 1940, p. 284, figs. 3–5: *Leuckartiara zacae* n.sp.; Pacific Ocean off Panama.

Leuckartiara sp. Vanhöffen 1913

Vanhöffen 1913*b*, p. 12, Pl. 1, figs. 8–10, Pl. 2, fig. 11, text-fig. 3: as *Tiara pileata*; Chile. Hartlaub 1913, p. 292: position uncertain.

Leuckartiara sp.

George 1953, p. 82: Calicut, southern India.

Genus ***Merga*** Hartlaub 1913*

Pandeidae with perradial edges of stomach connected with radial canals by mesenteries; with smooth gonads; with simple or faintly crenulated lips; with 4–8 or more long tentacles and as many or more rudimentary bulbs or tentaculae.

Type-species: *M. violacea* (Agassiz & Mayer).

Neppi & Stiasny 1911, p. 556: as *Tiara*. Hartlaub 1913, p. 249: *Merga* n.g.; p. 250: as *Mergintha* n.g.; p. 253: as *Tiarula* n.g. in part. Bigelow 1918, p. 373: *Mergintha* = *Merga*. Russell 1953, p. 179: *Tiarula* = *Merga*.

Merga reesi Russell 1956

10 mm high and wide, with fairly thin walls; no apical projection. Stomach very large, almost as long as bell cavity, connected with the radial canals

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* See Addenda, p. 444, for an additional species.

along almost whole length of perradial edges; gonads completely covering interradial walls of stomach. Four perradial tentacles with large, conical bulbs and four interradial, tenon-like tentaculae. Stomach rich reddish-brown.

Russell 1956*d*, p. 493, text-fig. 1: *Merga reesi* n.sp.; off mouth of English Channel. Kramp 1959*a*, pp. 116, 239, 240, fig. 108: diagnosis; distribution.

Merga tergestina (Neppi & Stiasny 1912)

7 mm high and 4 mm wide, with thin walls and a high, pointed apical projection. Manubrium half to 2/3 as long as bell cavity; lips faintly crenulated; gonads adradial, smooth; mesenteries fairly short. 4–8 tentacles with ocelli and a few very small rudimentary bulbs without ocelli.

Neppi & Stiasny 1912, p. 556: as *Tiara tergestina* n.sp.; Trieste. Neppi 1912, p. 720: as *Tiara tergestina*; Dalmatian coast, Adriatic Sea. non Hartlaub 1913, p. 253, fig. 209: as *Tiarula tergestina* n.g. Neppi & Stiasny 1913*b*, p. 43, Pl. 1, fig. 10: as *Tiara tergestina*; Trieste. non Kramp 1955*a*, p. 250: *Merga tergestina*; Gulf of Guinea, W. Africa. Kramp 1959*a*, pp. 116, 223, 227; diagnosis; distribution; (fig. 107 is *Amphinema dinema*). Vannucci & Yamada 1959, pp. 320–33, figs. 1–7: life cycle; Naples, Italy.

Merga violacea (Agassiz & Mayer 1899)

Up to 11 mm high and 7 mm wide, with thick walls and dome-like apex. Manubrium about half as long as bell cavity, cross-shaped in section; four slightly crenulated lips, mesenteries very long; gonads adradial, smooth. 8–12 long tentacles and 24–36 rudimentary tentacles, all with ocelli.

Agassiz & Mayer 1899, p. 160: as *Pandea violacea* n.sp.; Fiji Islands. Bigelow 1909*a*, p. 205, Pl. 41, figs. 10, 11: as *P. violacea*; Acapulco Harbour, Mexico. Mayer 1910, pp. 119, 490, Pl. 11, fig. 7, Pl. 12, fig. 1, text-fig. 64: as *P. violacea*. (Capri, Italy); Tortugas, Florida; Bahamas. Hartlaub 1913, p. 249, fig. 204: *Merga* n.g. *violacea*; p. 250, fig. 205: as *Mergintha lobianci* n.g., n.sp., = *Pandea* sp. Lobianco 1903; (Capri, Italy). Bigelow 1918, p. 373: accepts the genus *Merga* for *Pandea violacea*; also refers *Mergintha lobianci* to *Merga*. Foerster 1923, p. 240: as *P. violacea*; reports Bigelow. Kramp 1924, p. 4: as *Merga lobianci*; Mediterranean Sea. Menon 1931, p. 502: Madras, India. Menon 1932, p. 7, Pl. 1, fig. 10: Madras, India. Nair 1951, p. 51: Trivandrum coast, India. Kramp 1953, p. 265: *Merga lobianci* = *M. violacea*; Great Barrier Reef, Australia. Russell 1953, p. 179: *Tiarula* synonym of *Merga*. Ganapati & Nagabhushanam 1958, pp. 92, 94: Vizagapatam coast, India. Kramp 1958*b*, p. 341: the Nicobars, Indian Ocean. Kramp 1959*a*, pp. 116, 224, 225, 231, 233, 265, 270, fig. 106: diagnosis; distribution.

Genus ***Neoturris*** Hartlaub 1913

Pandeidae with apical projection varying much in shape and size, sometimes much reduced; manubrium large and wide, with well developed mesenteries; gonads in eight adradial series of transverse folds directed interradially; interradial portion of stomach with isolated pits of gonads; with eight or more hollow tentacles with laterally compressed basal bulbs; without rudimentary tentacles or marginal warts.

Type-species: *N. pileata* (Forskål).

Hartlaub 1913, p. 323: *Neoturris* n.g. = *Tiara* in part and *Turris* in part.

Neoturris bigelowi Kramp 1959

Umbrella higher than wide, up to 21 mm in diameter; similar to *N. pileata*, but apical projection slender and pointed, the round pits in the interradial walls of the stomach faintly developed, edges of radial canals almost smooth even in large specimens, and the number of tentacles amounts to 120.

Bigelow 1919, p. 285: as *Neoturris pileata* (= *Turris pelagia* Agassiz & Mayer 1902); Philippines. Kramp 1959*c*, p. 237: *Neoturris bigelowi* n.sp.; Ceylon.

Neoturris crockeri Bigelow 1940

28 mm high, 32 mm wide (fragmentary specimen), walls thin, no apical projection. Manubrium almost as long as bell cavity, mesenteries in upper half. Manubrium a dense reddish-brown hue. Radial canals broad, nearly smooth. 38 tentacles of various sizes, no additional bulbs, bulbs compressed, clasping the exumbrella margin.

Bigelow 1940, p. 287, figs. 6–10: *Neoturris crockeri* n.sp.; Gulf of Panama.

Neoturris fontata (Bigelow 1909)

22 mm high, higher than wide, thin walls, a low dome-like apical projection. Manubrium long; lips complexly folded. Radial canals wide, with glandular diverticula throughout their length; ring canal somewhat jagged. 16 large, five intermediate and about 40 small tentacles; large tentacles with compressed bulbs with spurs; small tentacles with scattered granules of pigment. Each large bulb with abaxial pore.

Bigelow 1909*a*, p. 209, Pl. 39, fig. 8, Pl. 42, figs. 5–11: as *Turris fontata* n.sp.; California. Mayer 1910, p. 491: as *Clavula fontata*. Hartlaub 1913, pp. 326, 332, 334, 335: *Neoturris fontata*; remarks. Bigelow 1919, p. 284. Foerster 1923, p. 243.

Neoturris papua (Lesson 1843)

11 mm high, 6·2 mm wide (or larger), thin walls; a small apical projection with an apical canal; 8–12 narrow, light lines on exumbrella. Manubrium wide, lips considerably frilled; lips pink in preserved specimens; gonads several series of transverse folds separated in the interradii. Radial canals wide, with smooth edges; ring canal stout. 8–12 tentacles, perradial larger than interradial; ocelli not observed.

Lesson 1843, p. 283: as *Turris papua* n.sp.; Waigiou Island, Indonesia. Mayer 1910, p. 125: as *T. papua.* (Indian Ocean; tropical Pacific Ocean); p. 491: as *Clavula papua* (incl. *Tiara papua* Maas, Bigelow). Hartlaub 1913, pp. 333, 335: *Neoturris papua*, non = *Tiara papua* Maas 1905, 1909, Bigelow 1909*a*, which probably = *Leuckartiara oceanica* (Agassiz & Mayer 1902) and *L. intermedia* (Browne 1902). Uchida 1927*a*, p. 210, fig. 36: Japan. Kramp 1928, p. 56: *N. papua*, different from *N. pelagica*. Ranson 1929, pp. 209–15, 1 fig.: description; list of synonyms; different from *N. pileata*; list of previous localities; new locality: coast of Arabia. Ranson 1932*a*, p. 999. Ranson 1937, p. 327, fig. 4: ‘cnidactines’ and ‘cnidothylacies’. Chiu 1954*b*, p. 55: China. Kramp 1955*b*, p. 152: by Haeckel 1879 determined as *Oceania* sp.

Neoturris pelagica (Agassiz & Mayer 1902)

16 mm high, 9 mm wide; barrel-shaped, walls very thin; a small, solid apical projection. Manubrium large, joined to radial canals by four wide funnels; lips complexly folded. Lips and stomach walls between gonads pink. Gonads transversely folded with numerous papillae. Radial canals broad and jagged, in proximal part narrow and smooth. About 30 short tentacles with large, conical bases; no ocelli.

Agassiz & Mayer 1902, p. 142, Pl. 1, fig. 2: as *Turris pelagica* n.sp.; coast of California. Mayer 1910, p. 127: as *T. pelagica.* Hartlaub 1913, p. 335: *Neoturris pelagica.* Bigelow 1919, p. 285: *N. pelagica* = *N. pileata.* Foerster 1923, p. 243, Pl. 2, fig. 4: Departure Bay, Vancouver. Kramp 1928, p. 55: *N. pelagica*, different from *N. papua* and probably different from *N. pileata*; S.E. Australia.

Neoturris pileata (Forskål 1775)

Up to 25 mm wide and 40 mm high, when the apical projection is well developed, but it is sometimes much reduced. Manubrium large and broad, mouth with complexly folded and crenulated lips; gonads in numerous round pits on interradial sides of stomach between adradial series of transverse folds; mesenteries along proximal half of the perradial edges of stomach. Radial canals broad, with short, sometimes branched lateral diverticula; ring canal smooth. Up to 90 tentacles, usually 60–80, densely crowded, with laterally compressed, elongated basal bulbs without conspicuous abaxial spurs; no ocelli.

Forskål 1775, p. 110: as *Medusa pileata* n.sp.; Mediterranean. Mayer 1910, p. 123: as *Turris pileata* in part. Hartlaub 1913, p. 326, figs. 270–81: as *Neoturris pileata* n.g.; list of synonyms; (Mediterranean); N.W. Europe. ?Le Danois 1913*b*, p. 17, fig. 4: as *Tiara pileata*; Little Minch, Scotland. Le Danois 1913*c*, p. 352: as *Tiara pileata.* Le Danois 1913*d*, p. 308: Bay of Biscay. Neppi & Stiasny 1913*b*, p. 41: as *Turris coeca* Hartlaub; Trieste. Hartlaub 1917, p. 410: remarks to Kramp 1913*a*,; *Tiara pileata* Le Danois 1913*b*, probably = *Leuckartiara octona.* Pell 1918, p. 22: Adriatic Sea. Kramp 1920*a*, p. 7: between St Kilda and Rockall, N. of British Isles. Kramp 1920*b*, p. 4: E. of Rockall, N. of British Isles. ?Foerster 1923, p. 244, Pl. 2, figs. 5, 6: Departure Bay, Vancouver (determination uncertain). Kramp 1924, p. 7: Mediterranean. ?Peacock 1924, p. 58: as *Turris digitalis*; Cullercoats, England.

KRAMP & DAMAS 1925, p. 277: Norway. ?RANSON 1925*a*, p. 89: as *Turris digitalis*; Bay of Biscay. KRAMP 1926*a*, p. 92, Pl. 2, figs. 13, 14, text-fig. 37, map: N.E. Atlantic Ocean. KRAMP 1927, p. 101, map: Denmark. KRAMP 1928, p. 56: comparison between *N. pileata* Bigelow 1919 from Philippines and *N. pelagica* from Australia, which presumably is a distinct species. RANSON 1930*b*, figs. 1–3: Mediterranean. CANDEIAS 1932, p. 3: Portugal. RANSON 1932*a*, p. 996, fig., maps: *N. pileata – Turris coeca* Neppi & Stiasny 1913*b*; Villefranche, Mediterranean. THIEL 1932*a*, p. 137. THIEL 1932*b*, pp. 441 ff.: distribution. KRAMP 1937*b*, p. 69, fig. 28: Denmark. PELL 1938, p. 923: Adriatic Sea. KRAMP 1939*a*, p. 9: Iceland. RUSSELL 1939*a*, p. 177: North Sea. KRAMP 1947, p. 50: S. of Iceland; Atlantic Ocean between Newfoundland and S. England. KRAMP 1948*b*, p. 20: Faroe-Shetland Channel. RUSSELL 1953, p. 203, Pl. 12, fig. 1, text-figs. 104–6: British coasts. HURE 1955, p. 6: as *N. coeca*; Adriatic Sea. KRAMP 1955*b*, p. 153: by Haeckel 1879 determined as *Turris digitalis*. VANNUCCI 1956*b*, pp. 245, 246, 248: Clyde Sea, Scotland. KRAMP 1957*a*, pp. 17, 97, 124, text-fig. 2: S.W. Africa. PETERSEN 1957, p. 28: W. of Faroes. KRAMP 1958*a*, pp. 119, 127: Villefranche, Mediterranean. KRAMP 1959*a*, pp. 15, 122, 215, 220, 221, 223, 227, 228, fig. 124: west coast of Africa; diagnosis; distribution. WERNER 1959*a*, p. 33: Port Erin, Isle of Man.

Genus ***Niobia*** Mayer 1900

Pandeidae with four main radial canals, two of which bifurcate, so that six canals reach the ring canal. Gonads interradial; no mesenteries; four simple lips. The marginal tentacles develop into medusae by a peculiar process.

Type-species: *N. dendrotentacula* Mayer.

MAYER 1900*b*, p. 36: *Niobia* n.g.

Niobia dendrotentacula Mayer 1900

4 mm wide, flatter than a hemisphere. 12 marginal tentacles; each tentacle bulb is successively developed into a small medusa.

MAYER 1900*b*, p. 36, Pls. 42, 43, text-figs. 141–4: *Niobia dendrotentacula* n.g., n.sp.; Tortugas, Florida. MAYER 1910, p. 187, Pl. 19, figs. 1–5. HARTLAUB 1913, p. 238. VANHÖFFEN 1913*a*, p. 419: Tortugas, Florida. BIGELOW 1915*b*, p. 316: between Cape May and Chesapeake Bay, east coast of North America. DAWYDOFF 1936, p. 469: as *Niobia*; French Indochina. BERRILL 1950, p. 310, fig. 9*a–c*. NAIR 1951, p. 55: is provisionally included in Bythotiaridae; Trivandrum coast, India. BRINCKMANN 1959, pp. 334–6, figs. 1, 2: Naples, Italy. KRAMP 1959*a*, pp. 115, 211, 231, 272, fig. 104: diagnosis; distribution.

Genus ***Octotiara*** Kramp 1953

Pandeidae with eight simple radial canals; with or without stomachal peduncle; with transversely folded gonads; without mesenteries.

Type-species: *O. russelli* Kramp.

KRAMP 1953, p. 266: *Octotiara* n.g.

Octotiara russelli Kramp 1953

Diameter 7 mm. Stomachal peduncle large and broad; stomach with eight deep longitudinal folds; mouth with eight short lips; gonads in eight rows of 6–8 transverse folds. Eight large tentacles and eight rudimentary between two of the large tentacles, 64 in all; no ocelli.

KRAMP 1953, p. 266, Pl. 1, figs. 1–3: *Octotiara russelli* n.g., n.sp.; Great Barrier Reef, Australia.

Octotiara violacea Kramp 1959

More than 8 mm wide; no stomachal peduncle. Stomach attached to subumbrella by a star-shaped figure of eight radiating lines; manubrium in its entire length with eight deep longitudinal furrows; gonads along each side of the eight perradial edges of the stomach, deeply transversally folded, each with 8–10 furrows; mouth tube long, with eight sharp edges terminating in eight pointed lips. Proximal parts of the eight radial canals with a few short, simple lateral diverticula. 16 large tentacles, 3–4 very small rudimentary bulbs between successive tentacles; no ocelli. The walls of the stomach between the gonads have a dark, almost black violet colour.

KRAMP 1959*c*, p. 234, fig. 8*a-c*: *Octotiara violacea* n.sp.; Ceylon.

Genus ***Pandea*** Lesson 1843

Pandeidae with or without apical projection; radial canals ribbon-like. Tentacles more than eight. Lips wide and folded. Gonads at first in the adradii and eventually encircling the manubrium, forming complex network, reticulated.

Type-species: *P. conica* (Quoy et Gaimard).

LESSON 1843, p. 288: *Pandea* n.g. MAYER 1910, p. 116. HARTLAUB 1913, p. 336. BIGELOW 1918, p. 372. RANSON 1936*b*, p. 81: discussion.

Pandea conica (Quoy & Gaimard 1827)

Up to 21 mm high, 10 mm wide; with a conical apex terminating with a peculiar patch of thickened ectoderm; exumbrella with longitudinal ribs and ridges. Manubrium about half as long as bell cavity, with short mouth tube and folded lips. Radial canals fairly narrow, smooth, mesenteries long. 16–24 tentacles with laterally compressed basal bulbs, with an abaxial ocellus.

QUOY & GAIMARD 1827, p. 182, Pl. 6A, figs. 3, 4: as *Dianaea conica* n.sp. LESSON 1843, p. 288: *Pandea conica.* MAYER 1910, p. 118, fig. 63: *Pandea conica.* (Mediterranean); Naples (new record); p. 125: as *Turris reticulata* (Tristan d'Acunha). VANHÖFFEN 1911*a*, p. 209: as *Tiara (Pandea) conica,* = *Tiara reticulata* Haeckel, only one species exists; *Pandea minima* von Lendenfeld and *P. violacea* Ag. & Mayer are juvenile stages of indeterminable Tiaridae. and *P. saltatoria* belongs to *Aglantha*;

recorded from Agulhas-Current. HARTLAUB 1913, p. 338, figs. 283, 286, 287: new locality Bay of Biscay (erroneous). BIGELOW 1918, p. 373: referred to *P. conica*, but possibly a new species; between Chesapeake Bay and Bermudas. KRAMP 1920*a*, p. 7: Straits of Gibraltar. KRAMP 1924, p. 8, map: Mediterranean. UCHIDA 1927*a*, p. 214, fig. 38: Misaki, Japan. KRAMP 1928, p. 57: Misaki, Japan; Philippines. RANSON 1930*a*, figs. 1, 2: Mediterranean. RANSON 1932*a*, p. 999: Mediterranean. BENAZZI 1933, p. 212: as *Oceania conica*. RANSON 1936*b*, p. 84, Pl. 1, figs. 1–6: survey of distribution; near Baleares. RANSON 1937, p. 318, fig. 2: ' cnidactines '. BIGELOW 1938, p. 106: morphological remarks; Bermudas. VANNUCCI 1951*a*, p. 106: as *Turris reticulata*; refers Mayer 1910. RUSSELL 1953, p. 207, figs. 107–10: *Tiara pileata* var. *ampullacea* Haeckel from Scotland possibly = *P. conica*. CHIU 1954*a*, p. 42, Pl. 8, fig. 28: Amoy, China. CHIU 1954*b*, pp. 50, 52: China. KRAMP 1955*a*, p. 251: Gulf of Guinea. KRAMP 1955*b*, p. 151: by Haeckel determined as *P. saltatoria*, *Tiara pileata* and *T. reticulata*. PICARD 1956, pp. 1–11, text-figs. 1–3: hydroid *Campaniclava cleodorae*; Villefranche-sur-Mer, Mediterranean. EBBECKE 1957, p. 151: as *Oceania conica*; reflex investigations; Naples. KRAMP 1957*a*, pp. 17, 124: West Africa; off Argentine, South America. KRAMP 1959*a*, pp. 16, 123, 222, 223, 225, 227, 231, 232, 235, 237, 238, 242, 244, 245, 246, 248, 249, 252, fig. 127: Sargasso Sea; west of Spain; east of the Azores; diagnosis; distribution.

Pandea minima von Lendenfeld 1884

3 mm high, 2 mm wide; eight adradial lines of nematocysts. Manubrium slender, half as long as bell cavity, four small lips; four longitudinal gonads, narrow and smooth. Eight tentacles. (Doubtful species.)

VON LENDENFELD 1884*a*, p. 916, Pl. 42, figs. 10–12: *Pandaea minima* n.sp; New South Wales, Australia. MAYER 1910, p. 118. KRAMP 1953, p. 310: indeterminable.

Pandea rubra Bigelow 1913

Up to 75 mm high and wide, with fairly thin, soft walls, no apical projection. Manubrium wide, half as long as bell cavity, attached to perradii for 4/5 of the length of radial canals; mouth-rim cruciform, very complexly folded; gonads close network on entire interradial areas. Radial canals jagged. Up to 24 tentacles; large, conical bulbs, not compressed. Subumbrella, manubrium, velum and tentacles deep brownish-red.

BIGELOW 1913, p. 14, Pl. 2, figs. 1–7: *Pandea rubra* n.sp.; San Francisco to Unalaska Island, north-western Pacific. HARTLAUB 1913, p. 340, fig. 288: reports Bigelow 1913. KRAMP 1920*b*, p. 4: northern Atlantic Ocean. FOERSTER 1923, p. 240: reports Bigelow 1913. KRAMP 1926*a*, p. 96, Pl. 2, fig. 15, map: distribution. THIEL 1932*a*, p. 137. THIEL 1932*b*, pp. 441 ff.: distribution. RANSON 1937, p. 325: ' cnidactines ' not found in *P. rubra*. BIGELOW 1938, p. 107: morphological remarks; Bermudas. RUSSELL 1953, p. 211, figs. 111, 112. NAUMOV 1956*b*, p. 37. KRAMP 1957*a*, pp. 18, 98, 99, 126: S. of Africa; Weddell Sea, Antarctic. KRAMP 1957*b*, pp. 155, 162: Antarctic Sea. KRAMP 1959*a*, pp. 123, 253, 255, 256, 261, 262, 269, fig. 128: diagnosis; distribution.

Pandea sp. Browne 1916

Young stage; exumbrella with conspicuous longitudinal ridges of nematocysts above all tentacles and bulbs, the perradial ridges extend to summit. Gonads not yet developed. Four perradial and four interradial tentacles and eight adradial bulbs in state of development; ocelli present.

BROWNE 1916*a*, p. 182: *Pandaea* juv.; Chagos Archipelago, Indian Ocean.

Pandea sp. Moore 1948

MOORE 1948, p. 6: *Pandea* sp.; Bermudas.

Pandea sp. juv.

KRAMP 1959*c*, p. 233: Ceylon.

Genus **Pandeopsis** Kramp 1959

Pandeidae with large stomach with broad base, perradial edges of stomach closely connected with the radial canals by long mesenteries; with smooth interradial gonads; mouth with simple lips; with four simple radial canals; with several marginal tentacles; without cirri or tentaculae; tentacle bulbs with abaxial ocelli, without abaxial spurs.

Type-species: *P. scutigera* Kramp

KRAMP 1959*c*, p. 232: *Pandeopsis* n.g.

Pandeopsis scutigera Kramp 1959 *

Up to 4·5 mm wide, almost globular, jelly very thick, especially in apical portion. Stomach short and very broad, quadrangular, its entire upper surface attached to the subumbrella; the perradial edges of the stomach in their entire length adnate to the radial canals. Mouth rim almost smooth, with four simple lips; the manubrium is about half as long as the bell cavity. Four interradial gonads, each like a flat sheet with trapezoid outlines, completely smooth, and entirely covering the four lateral sides of the stomach. The distal, free portions of the radial canals are short and narrow, ring canal and velum narrow. Eight marginal tentacles, each with an elongated pear-shaped basal bulb with a broad, heart-shaped base and a small but distinct black abaxial ocellus; no abaxial spur; eight small, adradial rudimentary bulbs. In living specimens each of the gonads is provided with three or four small dark-red spots.

KRAMP 1959*c*, p. 232, fig. 7*a*, *b*: *Pandeopsis scutigera* n.g., n.sp.; Gulf of Siam; Philippines; Java Sea.

Genus **Paratiara** Kramp & Damas 1925

Pandeidae with smooth interradial gonads; mouth with four simple lips; with well developed mesenteries. The four marginal tentacles with abaxial spurs.

Type-species: *P. digitalis* Kramp & Damas.

KRAMP & DAMAS 1925, p. 273: *Paratiara* n.g.

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* See Addenda, p. 444.

Paratiara digitalis Kramp & Damas 1925

10 mm high, 5 mm wide; cylindrical with thin walls and flat top. Manubrium flask-shaped, 2/3 of the length of bell cavity, with mesenteries; four simple lips; manubrium cross-shaped in cross-section, more or less twisted, the perradial edges all turned towards one side; gonads smooth, completely covering the stomach walls except in the perradii. Four perradial tentacles with conical basal bulbs, each with a well developed, ectodermal, abaxial spur; no ocelli.

KRAMP & DAMAS 1925, p. 273, figs. 18–20: *Paratiara digitalis* n.g., n.sp.; Vardö, Norway. KRAMP 1926*a*, p. 66, map: S. of Iceland; between Shetland and Norway. THIEL 1932*a*, p. 135. YASHNOV 1948, p. 70, Pl. 19, fig. 4: (Barents Sea.) KRAMP 1959*a*, pp. 12, 115, 208, 210, 215, 218, 221, 231, 232, fig. 105: Sargasso Sea; diagnosis; distribution.

Genus ***Protiara*** Haeckel 1879

Pandeidae with four well developed tentacles with hollow basal bulbs; with four or eight longitudinal gonads on the interradial sides of the stomach, smooth; four simple lips, not folded nor crenulated; no mesenteries.

Type-species: *P. tetranema* (Péron & Lesueur).

HAECKEL 1879, p. 46: *Protiara* n.g. FEWKES 1882*a*, p. 276: as *Halitiara* n.g. MAYER 1910, p. 105: *Protiara*, =*Halitiara* Fewkes 1882*a*. HARTLAUB 1913, p. 248. BIGELOW 1919, p. 281: *Halitiara* non =*Protiara*; discussion of genus, only three species.

Protiara haeckeli Hargitt 1902

2–4 mm high and about half as broad, somewhat oblong, with an extended apical projection. Gastric portion of manubrium rather large, subquadrate in cross-section; mouth simple with slightly everted lobes; gonads in four rather prominent masses surrounding manubrium. Four tentacles with rather prominent bulbs; no ocelli.

HARGITT 1902*a*, p. 16, fig. 4: *Protiara haeckeli* n.sp.; Vineyard Sound, Massachusetts, U.S.A. MAYER 1910, p. 106: as *Protiara borealis*, =*Plotocnide boreale* Wagner 1885 and ?*Protaria haeckeli* Hargitt. HARTLAUB 1913, p. 251, fig. 207: *P. haeckeli*, non = *Plotocnide boreale*. BIGELOW 1914*b*, p. 4: as *Sarsia haeckeli*, ? =*Protiara borealis*. KRAMP 1959*a*, p. 114, fig. 101: diagnosis.

Protiara tetranema (Péron & Lesueur 1809)

4 mm high, 4 mm wide, almost cubical, without apical projection. Stomach likewise cubical, half as long as bell cavity; lips simple, not folded. Gonads four, cylindrical, perradial(!). Four long tentacles, bulbs thickened, with ocelli.

PÉRON & LESUEUR 1809, p. 347: as *Oceania tetranema* n.sp. HAECKEL 1879, p. 47:

Protiara tetranema n.g.; English Channel; Holland; France. MAYER 1910, p. 106: as *P. beroë*, in part. HARTLAUB 1913, p. 250, fig. 206. PELL 1918, pp. 22, 24: Adriatic Sea. THIEL 1932*a*, p. 135: critical remarks on *P. beroë*. PELL 1938, p. 922: Adriatic Sea. KRAMP 1959*a*, p. 114: diagnosis.

Protiara tropica Bigelow 1912

9 mm high and wide; globular, thick walls. Manubrium about half as long as bell cavity, mouth quadratic, no lips, margin smooth; eight completely separated gonads along whole length of perradial corners of the stomach, smooth. Four cylindrical tentacles, no ocelli.

BIGELOW 1912, p. 253: *Protiara tropica* n.sp.; Philippines. BIGELOW 1919, p. 281, Pl. 39, figs. 1–4: Philippines. KRAMP 1928, p. 54, figs. 25, 26: Kei Islands, Pacific Ocean.

Genus ***Stomotoca*** L. Agassiz 1862

Pandeidae with two opposite, perradial tentacles and numerous marginal warts. Stomach on broad peduncle, extending beyond bell margin. Gonads in eight adradial rows, well separated.

Type-species: *S. atra* L. Agassiz.

L. AGASSIZ 1862, p. 347: *Stomotoca* n.g. MAYER 1910, p. 108: *Stomotoca*, incl. *Amphinema*. HARTLAUB 1913, p. 254: *Stomotoca*.

Stomotoca atra L. Agassiz 1862

20–25 mm high, 22–23 mm wide, bell-shaped. Mouth-rim smooth, not crenulated; gonads simple folds. About 80 small rudimentary tentacles.

L. AGASSIZ 1862, p. 347: *Stomotoca atra* n.g., n.sp.; Port Townsend, west coast of N. America. HAECKEL 1879, p. 53. MAYER 1910, p. 111. HARTLAUB 1913, p. 255, fig. 212. VANHÖFFEN 1913*b*, p. 14, Pl. 2, figs. 12–16: Peru. BIGELOW 1918, pp. 370–2: *S. atra* different from *S. pterophylla*. FOERSTER 1923, p. 239: localities of W. America; Vancouver. STRONG 1925, p. 384: development; Puget Sound, Pacific coast of America. HYMAN 1940, pp. 282 ff.: physiology; Puget Sound, Pacific coast of America.

Stomotoca pterophylla Haeckel 1879

10–12 mm high, 20–30 mm wide, conical, very thick at aboral pole, with a sharply pointed apex. Stomach large, swollen; mouth with four prominent, complexly crenulated lips; gonads complexly transversely folded. Two very long opposite tentacles, 60–80 rudimentary marginal warts; no ocelli.

HAECKEL 1879, p. 52, Pl. 4, fig. 10: *Stomotoca pterophylla* n.sp.; West Indies. MAYER 1910, p. 113, Pl. 29, figs. 3–5, Pl. 30, fig. 7: as *S. pterophylla*; warmer part of Gulf Stream; Bahamas; Tortugas, Florida; pp. 114, 490, fig. 61: as *S. divisa* Maas 1897; Panama. HARTLAUB 1913, p. 254, fig. 211: as *S. divisa*, ? = *S. pterophylla*. VANHÖFFEN 1913*b*, p. 14: as *S. atra*; joins the three species into one; Callao, Peru.

Bigelow 1917, p. 306: off Georges Bank, east coast of North America. Bigelow 1918, p. 372: certifies that *S. divisa* Maas = *S. pterophylla*, = *S. atra* Vanhöffen 1913b in part; new localities: Straits of Florida; N. of Bahama Bank. Foerster 1923, p. 239: as *S. divisa*; report of localities in W. America. Bigelow 1926, p. 54: Gulf of Maine. Boone 1933, p. 27: as *S. divisa*; S.W. of Cape Mala, Panama. Ranson 1936*b*, p. 63: discussion of genus and species; Sargasso Sea. Bigelow 1940, p. 283: Pacific Ocean off Colombia, U.S.A. Uchida 1940*a*, p. 284, fig. 3: northern Japan. Kramp 1955*a*, p. 250: Gulf of Guinea. Kramp 1955*b*, p. 151. Kramp 1959*a*, pp. 119, 211, 212, 214, 227, 231, 265, 266, 270, fig. 115: diagnosis; distribution.

Genus ***Urashimea*** Kishinouye 1910

Pandeidae with four jagged radial canals; with four hollow tentacles with numerous stalked nematocyst knobs on the whole surface. Exumbrella with several meridional nematocyst tracks. Abaxial ocelli. Manubrium short, with four folded lips covered with nematocysts. 16 sac-like, folded gonads in the adradii, eight in the young.

Type-species: *U. globosa* Kishinouye.

Kishinouye 1910, p. 27: *Urashimea* n.g.

Urashimea globosa Kishinouye 1910

10 mm high, 8·5 mm wide, globular. About 20 lines of nematocysts on exumbrella. Manubrium short, four-sided, with four frilled lips with nematocysts; gonads 8–16 sac-like protuberances in adradii of stomach. Four long tentacles with numerous stalked nematocyst knobs.

Kishinouye 1910, p. 27, Pl. 5, figs. 27–9: *Urashimea globosa* n.g., n.sp.; Japan; Saghalin; p. 28, Pl. 5, fig. 30: as *U. macrotentaculata* n.sp.; Japan. Mayer 1910, p. 722: *U. globosa* = *U. macrotentaculata.* Hartlaub 1913, p. 344, figs. 291, 292: *U. globosa* *Zanclea* sp. Maas 1909; belongs to Tiaridae. Hartlaub 1917, p. 400: *Zanclea* sp. Maas 1909 is presumed = *Urashimea.* Uchida 1925*b*, p. 80, figs. 2–6: as *Zanclea maasi* n.sp.; Japan. Uchida 1927*a*, p. 205, Pl. 10, fig. 8, text-fig. 34: discussion of *Urashimea*; all Japanese localities. Uchida 1927*b*, p. 218: *Z. maasi* = *U. globosa* + *U. macrotentaculata*; Okunai, Japan. Uchida 1930, p. 330: examination of Maas's specimen. Thiel 1932*a*, p. 138. Thiel 1932*b*, pp. 441 ff.: distribution. Uchida 1938*b*, p. 39: Saghalin; Hokkaido; Honshu. Uchida 1940*a*, p. 286: Japan. Chiu 1954*a*, pp. 41, 42, Pl. 1, figs. 1, 2: Amoy, China. Chiu 1954*b*, pp. 50, 52, 56: China. Naumov 1956*b*, pp. 37, 39: discussion.

Genus ***Zanclonia*** Hartlaub 1913

Pandeidae with long, transversal diverticula on both sides of the four radial canals; with several tentacles provided with numerous stalked nematocyst knobs on their adaxial side.

Type-species: *Z. weldoni* (Browne).

Hartlaub 1913, p. 314: *Zanclonia* n.g.

Zanclonia weldoni (Browne 1910)

Up to 30 mm high; bell-shaped, with thick walls and a rounded summit. Stomach large and globular, half as long as bell cavity; mouth large with folded lips; gonads in eight longitudinal rows of transverse folds. Four broad radial canals, each with about 20 pairs of long diverticula at right angles to radial canals. About 24 long tentacles, each with an adaxial series of filaments with nematocysts.

BROWNE 1910, pp. 4, 7, 13, 24, 25, Pl. 1, figs. 1–5: as *Catablema weldoni* n.sp.; McMurdo Sound and Cape Adare, Antarctic. VANHÖFFEN 1912, p. 362, Pl. 24, fig. 3: as *C. weldoni*; Gauss Station, Antarctic. HARTLAUB 1913, p. 313, figs. 261, 262: *Zanclonia weldoni* n.g. KRAMP 1957*a*, pp. 18, 110 ff., 124, text-fig. 3, map: Antarctic. KRAMP 1959*a*, pp. 124, 235, 269, fig. 130: diagnosis; distribution.

Family *CALYCOPSIDAE*

Anthomedusae without apical projection; without gastric peduncle; mouth with four simple or crenulated lips; with simple or folded gonads on stomach walls; with four or eight simple or branched radial canals; with or without centripetal canals; with eight or more hollow marginal tentacles without basal swellings and each terminating in a large nematocyst cluster; with or without rudimentary or dwarf tentacles; with or without ocelli. Hydroids unknown.

Genus ***Bythocellata*** Nair 1951

Calycopsidae with rows of nematocysts on exumbrella; with eight separate unbranched radial canals; without centripetal canals; eight marginal tentacles; tentacle bases with ocelli on the outer side; without secondary tentacles.

Type-species: *B. cruciformis* Nair.

NAIR 1951, p. 56: *Bythocellata* n.g.

Bythocellata cruciformis Nair 1951

4 mm high, 3·5 mm wide, bell-shaped. Exumbrella with eight meridional rows of nematocysts from base of tentacles to apex. Manubrium half as long as bell cavity, mouth cruciform. Eight straight, flat radial canals with smooth edges. Four interradial gonads. Eight stiff, hollow tentacles with incomplete rings of nematocysts(!) no basal bulbs. Colourless except ocelli deep red.

NAIR 1951, p. 56, Pl. 1, figs. 4, 5: *Bythocellata cruciformis* n.g., n.sp.; Trivandrum coast, India.

Genus ***Bythotiara*** Günther 1903

Calycopsidae with four simple or bifurcate radial canals; without centripetal canals. Gonads interradial, with transverse furrows; with or without secondary tentacles.

Type-species: *B. murrayi* Günther.

Günther 1903, p. 424: *Bythotiara* n.g.

Bythotiara drygalskii Vanhöffen 1912

11 mm high. Stomach large; gonads eight, adradial, with transverse furrows. Four unbranched radial canals. Four perradial tentacles.

Vanhöffen 1912, p. 363, fig. 1: *Bythotiara drygalskii* n.sp.; N.W. of Gauss Station, Antarctic. Hartlaub 1913, p. 358, fig. 302.

Bythotiara murrayi Günther 1903

Up to about 20 mm wide and high; thick walls. Stomach small, with four interradial gonads with transverse furrows. Radial canals generally four, bifurcate (but additional branching may occur). Long tentacles as many as ends of radial canals; some small secondary tentacles and minute dwarf-tentacles.

Günther 1903, p. 424, Pl. 10, figs. 4, 5: *Bythotiara murrayi* n.g., n.sp.; S.W. of Ireland. Maas 1910, p. 2: description; Atlantic; Mediterranean. Mayer 1910, p. 185, figs. 97, 98: Naples, Mediterranean (new record). Vanhöffen 1911*a*, p. 213, fig. 9*a*, *b*, *c*: Nias Island, Indian Ocean. Vanhöffen 1912, p. 363: off mouth of Congo. Hartlaub 1913, p. 355, figs. 304–6: new record: Skagerrak. Grobben 1915, p. 5: Adriatic Sea. Neppi 1915, p. 5: Adriatic Sea. Kramp 1924, p. 12, figs. 9–11, map: Mediterranean. Kramp & Damas 1925, p. 281: Norway. Kramp 1926*a*, p. 97, figs. 38–40: S.W. of Ireland. Ranson 1936*b*, p. 93: discussion of genus, belongs to Tiaridae; p. 98, Pl. 1, fig. 12: Monaco; Baleares; Marseilles. Kramp 1937*b*, p. 72, fig. 29*a*: Denmark. Russell 1940*a*, p. 515: nematocysts; W. of Ireland. Kramp 1948*b*, p. 21: between Azores and Newfoundland; S.W. of Ireland. Russell 1953, p. 215, Pl. 13, fig. 1, text-figs. 113A, B, 114A, B, 115, 116. Kramp 1957*a*, pp. 23, 99, 126: S.W. Africa; Tristan da Cunha, Atlantic Ocean. Kramp 1959*a*, pp. 18, 125, 253, 255, 256, 259, 260, 263, 268, figs. 1, 132: Bay of Biscay; Sicily, Mediterranean; off west coast of Africa; diagnosis; distribution.

Genus ***Calycopsis*** Fewkes 1882

Calycopsidae with primarily four unbranched radial canals and with four or more centripetal canals arising from the ring canal, blind or joining the cruciform base of the stomach. Gonads transversely folded, frequently forming eight adradial rows of deep transverse furrows; basal portion of tentacles adnate to umbrella margin; all tentacles hollow, nematocysts only in the terminal knob.

Type-species: *C. typa* Fewkes.

Fewkes 1882*b*, p. 304: *Calycopsis* n.g. Mayer 1910, p. 130. Bigelow 1913, p. 21:

discussion of species. HARTLAUB 1913, p. 358: discussion. BIGELOW 1918, p. 377: *Calycopsis – Sibogita* Maas 1905; discussion of species; p, 381: survey of distribution of the species. BIGELOW 1919, p. 289: *Calycopsis – Sibogita*. KRAMP & DAMAS 1925, p. 284: discussion. BIGELOW 1940, p. 290: discussion of species; p. 293: key for determination. KRAMP 1959*a*, pp. 18–24: revision of species; pp. 24–6: geographical speciation.

Calycopsis bigelowi Vanhöffen 1911

16 mm high and wide; jelly thick. Gonads with about 10 transverse folds in each of the adradial rows. Four interradial centripetal canals, blind. Eight long and numerous, up to 40 small tentacles, all tentacles structurally alike.

VANHÖFFEN 1911*a*, p. 218, fig. 12: *Calycopsis bigelowi* n.sp.; Gulf of Aden. HARTLAUB 1913, pp. 357, 359, fig. 303. BIGELOW 1918, p. 377. BIGELOW 1940, p. 293. KRAMP 1957*a*, pp. 21, 98, 126, text-fig. 4, map: Cape of Good Hope. KRAMP 1959*a*, pp. 19, 25, 127, 239, 240, 270, fig. 136: diagnosis; distribution.

Calycopsis borchgrevinki (Browne 1910)

20 mm high, 15–18 mm wide. Gonads in pockets, embedded in the walls of the stomach. Four interradial centripetal canals, blind or joining base of manubrium: 8–16 tentacles.

BROWNE 1910, p. 17, Pl. 2, figs. 1–5: as *Sibogita borchgrevinki* n.sp.; Cape Adare, Antarctic. VANHÖFFEN 1911*a*, p. 215, Pl. 22, fig. 7, text-fig. 10*a*, *b*: *Calycopsis borchgrevinki*; considers *S. borchgrevinki* as juveniles of *C. typa*, but retains the specific name for a number of specimens from the ice-barrier between Bouvet Island and Enderby Land, Antarctic. VANHÖFFEN 1912, p. 364: Antarctic Ocean. BIGELOW 1913, pp. 21–2: *C. borchgrevinki* is temporarily separated from *C. typa*. HARTLAUB 1913, pp. 348, 359, fig. 296. BIGELOW 1918, p. 379. THIEL 1932*b*, p. 477. BIGELOW 1940, p. 293. KRAMP 1957*a*, pp. 20, 110 ff., 124, text-fig. 4, map: subantarctic Atlantic Ocean; South Shetland Islands; antarctic Pacific Ocean. KRAMP 1957*b*, pp. 155, 162: Antarctic Sea. KRAMP 1959*a*, pp. 19, 24, 126, 242, 252, 253, 261, 262, fig. 134: diagnosis; distribution.

Calycopsis chuni Vanhöffen 1911

Up to 38 mm high and 30 mm wide, jelly thick and rigid. Manubrium about half as long as bell cavity, lips fairly short, crenulated; gonads with 19–32 transverse folds in each row. 28–56 centripetal canals, most of them communicating either directly with the base of the stomach or with neighbouring canals close by the stomach. 16–32 tentacles.

VANHÖFFEN 1911*a*, p. 214, Pl. 22, fig. 6: as *Calycopsis typa*; Agulhas Current; p. 217, Pl. 22, fig. 8: *Calycopsis chuni* n.sp.; description; Cap Guardafui, Indian Ocean; Gulf of Aden. VANHÖFFEN 1912, p. 364: as *C. typa* (according to Hartlaub 1913); Indian and Atlantic Oceans. BIGELOW 1913, pp. 21, 22: *C. chuni* different from *C. typa*. HARTLAUB 1913, p. 360: as *C. valdiviae* n.sp. (Agulhas Current). BIGELOW 1918, p. 377: *C. chuni* is temporarily separated from *C. typa*; *C. valdiviae* is a valid species. BIGELOW 1940, pp. 290–3: as *C. valdiviae* and *C. chuni*. KRAMP 1955*a*.

p. 253: *C. typa* VANHÖFFEN 1912 non = *C. valdiviae*, probably = *C. papillata*. KRAMP 1959*a*, pp. 23, 25, 127, 239, 240, 270, fig. 140: *C. valdiviae* Hartlaub synonym of *C. chuni*; West Indies; off West Africa; diagnosis; distribution.

Calycopsis gara Petersen 1957

11 mm high, 9 mm wide, jelly fairly thick. Gonads with 15–16 transverse folds in each row. One interradial or two adradial centripetal canals in each quadrant, all joining base of stomach. About 50 long tentacles.

PETERSEN 1957, p. 29, fig. 1: *Calycopsis gara* n.sp.; northern Atlantic Ocean. KRAMP 1959*a*, pp. 127, 242, 243, fig. 137: diagnosis; distribution.

Calycopsis krampi Petersen 1957

5 mm high, 3 mm wide, jelly very thick. Manubrium large; gonads slightly folded. Four interradial centripetal canals. Four perradial tentacles, the base of each tentacle with a prominent projection on the adaxial side, pointing inwards into the bell cavity.

PETERSEN 1957, p. 31, figs. 2, 3: *Calycopsis krampi* n.sp.; northern Atlantic Ocean. KRAMP 1959*a*, pp. 126, 242, 243, fig. 135: diagnosis; distribution.

Calycopsis nematophora Bigelow 1913

Up to 30 mm high. Mouth with labial nematocyst knobs. About 16 canals, all (or nearly all) joining the cruciform base of the manubrium. Usually a large tentacle to each canal; several small tentacles.

BIGELOW 1913, p. 23, Pl. 2, fig. 8, Pl. 3, figs. 1–3: *Calycopsis nematophora* n.sp., = *C. simulans* in part; Bering Sea; Sea of Okhotsk. HARTLAUB 1913, p. 360, figs. 308–10: *C. nematophora* ? = *C. simulans* in part. BIGELOW 1918, p. 377: *C. nematophora* is a valid species. FOERSTER 1923, p. 244. THIEL 1932*a*, p. 139. THIEL 1932*b*, pp. 441 ff.: distribution. BIGELOW 1940, p. 283: key to determination. NAUMOV 1956*b*, p. 37. KRAMP 1959*a*, pp. 21, 25.

Calycopsis papillata Bigelow 1918

27–33 mm high, 26 mm wide, jelly very thick and rigid; each of the marginal lobes between the tentacles with a group of prominent gelatinous papillae. Eight centripetal canals, usually adradial in position, blind or joining base of stomach. 8–12 tentacles, all alike.

VANHÖFFEN 1912, p. 364: as *Calycopsis typa*; tropical part of Indian and Atlantic Oceans. BIGELOW 1918, p. 378, Pl. 2, figs. 1–7, Pl. 3, fig. 1: *Calycopsis papillata* n.sp.; Straits of Florida; N.E. Providence Channel, Bahamas. BIGELOW 1940, p. 293: key to determination. KRAMP 1955*a*, p. 252, Pl. 1, figs. 2, 3: off Angola, W. Africa; p. 309. KRAMP 1959*a*, pp. 20, 25, 127, 227, 229, 232, fig. 138*a*, *b*: West Indies (new records); diagnosis; distribution.

Calycopsis simplex Kramp & Damas 1925

8 mm high and wide, globular. Gonads in few transverse folds. Four blind, interradial centripetal canals. Eight tentacles, all alike.

KRAMP & DAMAS 1925, p. 282, figs. 23–5: *Calycopsis simplex* n.sp.; Norway. ?RUNNSTRÖM 1932, p. 28: as *Calycopsis* sp.; Hjeltefjord, Norway. KRAMP 1937*b*, p. 73, fig. 29*b*. BIGELOW 1940, p. 293: key to determination. KRAMP 1959*a*, pp. 19, 24, 126, 238, 240, fig. 133: diagnosis; distribution.

Calycopsis simulans (Bigelow 1909)

30 mm high, 22 mm wide. Eight centripetal canals, adradial, blind or joining base of manubrium. 12 large tentacles opposite to the canals and occasionally some small tentacles between the canals.

BIGELOW 1909*a*, p. 213, Pl. 5, figs. 4, 5, Pl. 41, figs. 8, 9, Pl. 43, figs. 1, 2: as *Sibogita simulans* n.sp.; between Galapagos Islands and Panama. MAYER 1910, p. 187. VANHÖFFEN 1911*a*, p. 214: *S. simulans* = *Calycopsis typa*. BIGELOW 1913, pp. 21–3: specimens referred to *C. simulans* from Bering Sea probably = *C. nematophora*; *C. simulans* from east tropical Pacific is a valid species. HARTLAUB 1913, pp. 348, 360, fig. 297: ? = *C. nematophora*. BIGELOW 1919, p. 292, Pl. 40, fig. 8, Pl. 41, fig. 1: as *C. typa* var. *simulans*; Philippines. BIGELOW 1940, p. 293: Pacific Ocean off Colombia. KRAMP 1959*a*, pp. 20, 25.

Calycopsis typa Fewkes 1882

Up to 37 mm high and 40 mm wide, jelly not very thick; a deep funnel-shaped depression in the apical jelly. Stomach large, broad, mouth with large, folded lips; gonads with numerous transverse folds in each row. 12–16 centripetal canals, blind or joining base of stomach. 16 long tentacles and up to 16 small ones.

FEWKES 1882*b*, p. 304, Pl. 1, fig. 34: *Calycopsis typa* n.g., n.sp.; Atlantic coast of U.S.A. BIGELOW 1909*a*, p. 206, Pl. 1, figs. 1–8: as *Sibogita nuarchus* n.sp.; New England, U.S.A. MAYER 1910, p. 131, fig. 70; p. 491: as *Sibogita typa*, = *S. nuarchus* Bigelow 1909. VANHÖFFEN 1911*a*, p. 214, Pl. 22, fig. 6: *C. typa*, = *S. simulans* and *S. nuarchus*; Agulhas Current. (Acc. to Hartlaub 1913 the specimens are not *C. typa*, but *C. valdiviae*.) VANHÖFFEN 1912, p. 364: Indian and Atlantic Oceans. (Acc. to Hartlaub 1913 the specimens are *C. valdiviae*.) BIGELOW 1913, p. 21: acknowledges that *Sibogita nuarchus* Bigelow 1909*a* = *C. typa*. HARTLAUB 1913, pp. 346, 359, figs. 293, 294, 307: Vanhöffen's specimens probably belong to *C. valdiviae* n.sp. BIGELOW 1915*b*, p. 316: S.E. of New York. BIGELOW 1918, p. 377: comparison with other species. BIGELOW 1922, p. 159: off New England, U.S.A., continental slope. BIGELOW 1940, p. 293: key of determination. KRAMP 1955*a*, p. 253: *C. typa* Vanhöffen 1912 probably = *C. papillata*. KRAMP 1959*a*, pp. 21, 25, 127, 211, 213, 227, fig. 139: Cape Verde, West Africa (new record); West Indies (uncertain record); diagnosis; distribution.

Calycopsis sp. ? Bigelow 1938

22 mm high. Abnormal; canals connected in an irregular network.

BIGELOW 1938, p. 108: *Calycopsis* sp. ?; Bermuda.

Genus **Eumedusa** Bigelow 1920

Calycopsidae with primarily four unbranched radial canals and with four (or more?) centripetal canals arising from the ring canal; gonads folded; with two kinds of tentacles, large hollow tentacles with rings of nematocysts and a terminal knob, and small solid tentacles without a terminal knob.

Type-species: *E. birulai* (Linko).

BIGELOW 1920, p. 7: *Eumedusa* n.g.

Eumedusa birulai (Linko 1913)

Up to 13 mm high and 10 mm wide. Gonads irregularly folded. Four interradial centripetal canals joining base of stomach in adult specimens. Eight or 16 long tentacles, hollow, with a terminal knob of nematocysts; numerous small, solid tentacles without terminal knob.

LINKO 1913: p. 8, Pl. 1, figs. 5, 6: as *Sibogita birulai* n.sp.; Siberian Polar Sea. BIGELOW 1920, p. 7, Pl. 1, figs. 4, 5, Pl. 2, figs. 1, 2: as *Eumedusa similis* n.g., n.sp.; Collinson Point, Alaska. THIEL 1932*a*, p. 139: as *E. similis*. THIEL 1932*b*, pp. 441 ff.: as *E. similis*; distribution. YASHNOV 1939, p. 113: as *Calycopsis birulai*, =*E. similis*; East Siberian Sea; Kara Sea; Laptev Sea. BIGELOW 1940, p. 290: *C. birulai* ?=*E. similis*; the genus *Eumedusa* is preserved. YASHNOV 1946, pp. 41, 49, fig. 1, map: as *C. birulai*; Arctic Sea north of Siberia and Alaska; report. YASHNOV 1948, p. 71, Pl. 19, fig. 7: as *C.* (*Sibogita*) *birulai*; Kara Sea; Laptev Sea; East Siberian Sea; Chukotsky Sea. KRAMP 1959*a*, pp. 129, 207, 208, 209, 269, fig. 141: diagnosis; distribution.

Genus **Heterotiara** Maas 1905

Calycopsidae with four simple radial canals; without centripetal canals; gonads purely interradial, without transverse folds; without secondary tentacles.

Type-species: *H. anonyma* Maas.

MAAS 1905, p. 19: *Heterotiara* n.g.

Heterotiara anonyma Maas 1905

Up to 22 mm high, 20 mm wide; thick walls. 8–12 tentacles.

MAAS 1905, p. 19, Pl. 3, figs. 19–21: *Heterotiara anonyma* n.g., n.sp.; Malayan Archipelago. BIGELOW 1909*a*, p. 216, Pl. 41, figs. 12, 13: Peru. MAYER 1910, pp. 107, 489. VANHÖFFEN 1911*a*, p. 211, Pl. 22, figs. 3, 4: Nias Island, Indian Ocean. BIGELOW 1913, p. 25: S.E. coast of Kamchatka; Bering Sea; San Francisco to Unalaska. HARTLAUB 1913, p. 350, figs. 298, 299. BIGELOW 1918, p. 382: Straits of Florida; N. of Bahama Bank. BIGELOW 1919, p. 287: discussion. FOERSTER 1923, p. 244. THIEL 1932*a*, p. 138. THIEL 1932*b*, pp. 441 ff.: distribution. BIGELOW 1938, p. 108: Bermuda Islands. RUSSELL 1940*a*, p. 516: nematocysts. NAUMOV 1956*b*, p. 37. KRAMP 1948*b*, p. 21: between Azores and Newfoundland. MOORE 1949, p. 6: Bermuda Islands. KRAMP 1959*a*, pp. 17, 125, 227, 230, 232, 242, 249, 271, Pl. 1, fig. 10, text-fig. 131: central Atlantic; north of Bermudas; West Indies; diagnosis; distribution.

Heterotiara minor Vanhöffen 1911

10 mm high, 8–10 mm wide. Thick walls. Up to about 20 tentacles.

Vanhöffen 1911*a*, p. 212, Pl. 22, fig. 5, text-fig. 8*a*, *b*: *Heterotiara minor* n.sp.; Nias Island, Indian Ocean. Browne 1916*a*, p. 183: N. of Chagos Islands, Indian Ocean. Bigelow 1919, p. 287, Pl. 39, fig. 9, Pl. 40, figs. 2–4: near Hong Kong, China; Philippines. Kramp 1928, p. 58, figs. 27, 28, 30: Philippines. Kramp 1953, p. 268: N.E. Australia. Kramp 1957*a*, pp. 23, 97, 105, 124: S.E. Africa. Ganapati & Nagabhushanam 1958, pp. 92, 94: Vizagapatam coast, India; as *Halitiara minor*.

Genus ***Kanaka*** Uchida 1947

Calycopsidae with four radial canals, of which the upper and lower halves are differentiated; without centripetal canals; eight long tentacles with terminal nematocyst knob; without secondary tentacles; ocellus uncertain. Manubrium short, with four well developed lips. Gonads seem to develop on the lower half of the radial canals (?).

Type-species: *K. pelagica* Uchida.

Uchida 1947*a* p. 303: *Kanaka* n.g.

Kanaka pelagica Uchida 1947

1·8 mm high, 1·5 mm wide, bell-like, apex thick. Manubrium short and small, four well developed lips. Four radial canals, straight and narrow, curved concave in middle portion, distal half slightly widened and ragged; (gonads developing in widened part of canals?). Eight tentacles, long, hollow, with a terminal knob of nematocysts; bulbs ‘distinguishable’. Probably = *Heterotiara minor*.

Uchida 1947*a*, p. 303, fig. 5: *Kanaka pelagica* n.g., n.sp.; central Pacific Ocean. Kramp 1953, p. 268: probably = *Heterotiara minor*.

Genus ***Meator*** Bigelow 1913

Calycopsidae with four simple radial canals; without centripetal canals; with eight smooth, adradial gonads; tentacles without terminal knob, and of different sizes. Systematic position uncertain.

Type-species: *M. rubatra* Bigelow.

Bigelow 1913, p. 12: *Meator* n.g.

Meator rubatra Bigelow 1913

17 mm high, 18 mm wide. Jelly very thick, globular. Stomach cruciform, connected with radial canals in entire length. Four large, perradial, and numerous small tentacles, all without terminal knob.

Bigelow 1913, p. 12, Pl. 1, figs. 1–3: *Meator rubatra* n.g., n.sp.; Sea of Okhotsk.

HARTLAUB 1913, p. 352, figs. 300, 301: belongs to Calycopsidae. UCHIDA 1927*a*, p. 208: referred to Tiaridae. THIEL 1932*a*, p. 138. THIEL 1932*b*, pp. 441, 462: distribution. NAUMOV 1956*b*, p. 37.

Genus ***Sibogita*** Maas 1905

Calycopsidae with radial canals which branch repeatedly at various levels; without centripetal canals; gonads transversely folded.

Type-species: *S. geometrica* Maas.

MAAS 1905, p. 17: *Sibogita* n.g. BIGELOW 1918, p. 377: *Sibogita*=*Calycopsis*. KRAMP 1959*a*, p. 26: *Sibogita* a valid genus, different from *Calycopsis*.

Sibogita geometrica Maas 1905

38 mm high, about 20 mm wide; gonads in about 13 transverse folds in each row. The four primary radial canals give rise to alternating lateral branches, from which lateral branches of second and third order arise at various levels, 22–32 canals join the ring canal. Tentacles of same number as or half as many as the canals.

MAAS 1905, p. 17, Pl. 3, figs. 16–18: *Sibogita geometrica* n.g., n.sp.; Celebes. BIGELOW 1909*a*, p. 213: comparison with *S. simulans*. MAYER 1910, p. 186, fig. 99. VANHÖFFEN 1911*a*, p. 214: the name *Sibogita* is only maintained for this species. HARTLAUB 1913, p. 359. BIGELOW 1918, p. 377: as *Calycopsis geometrica*. BIGELOW 1919, p. 290, Pl. 40, figs. 5–7, Pl. 41, fig. 2: as *C. geometrica*; Philippines. BIGELOW 1940, p. 293: as *C. geometrica*; key to determination. KRAMP 1959*a*, pp. 28, 222, 223, 270: diagnosis; distribution.

Sibogita geometrica occidentalis Kramp 1959

About 30 mm high and up to 40 mm wide, jelly fairly thick. Manubrium very small; mouth with four small, simple lips; gonads in eight adradial rows, about six transverse folds in each row; radial canals repeatedly dichotomously branched at various levels, 34–43 canals joining the ring canal. About 30 large tentacles alternating with as many small ones, each flanked by a pair of minute wart-like protuberances.

KRAMP 1959*a*, pp. 28, 129, Pl. 1, figs. 11, 12, Pl. 2, figs. 2, 3, text-figs. 4, 5: *S. geometrica occidentalis* n. subsp.; east of the Azores; Bay of Biscay.

Family *RUSSELLIIDAE*

Anthomedusae with unbranched oral tentacles without terminal clusters of nematocysts, situated above the mouth opening; mouth with four simple perradial lips; with groups of hollow marginal tentacles without basal swellings, partly sunk into narrow fissures of the umbrella margin; with adaxial ocelli. Hydroids unknown.

Genus ***Russellia*** Kramp 1957

Russelliidae with an apical projection; with cruciform stomach mounted upon a peduncle; with four pointed oral tentacles; with eight smooth, adradial gonads; with four simple radial canals; with eight groups of marginal tentacles, each group with one large and two small tentacles, the basal part of the large tentacle sunk into a deep furrow of the umbrella margin; with an adaxial ocellus at the base of the free portion of the tentacle.

Type-species: *R. mirabilis* Kramp.

KRAMP 1957*a*, p. 23: *Russellia* n.g.

Russellia mirabilis Kramp 1957

9 mm wide, 15 mm high including the large apical projection. Stomach cruciform, about half as long as bell cavity, upon a short, broad peduncle; gonads eight adradial, smooth, occupying entire length of stomach; mouth quadrangular, with very short perradial lips; four perradial oral tentacles inserted above the mouth, finger-shaped, pointed, with scattered nematocysts along entire length. Four perradial and four interradial, hollow tentacles, their basal part deeply sunk into a narrow fissure between two prominent lobes of the umbrella margin, each with an adaxial red ocellus, and each flanked by a pair of small tentacles of similar structure.

KRAMP 1957*a*, pp. 27, 96, Pl. 4, figs. 1–6, text-fig. 4, map: *Russellia mirabilis* n.g., n.sp.; W. of Graham Land, Antarctic; between South Georgia and South Sandwich Islands; east of South Shetland Islands. KRAMP 1959*a*. pp. 30, 129, 239, 240, 269, fig. 142: West Indies; diagnosis; distribution.

Family *POLYORCHIDAE*

Anthomedusae with a more or less pronounced gastric peduncle; with four oral lips densely set with nematocysts forming distinct marginal band; with four radial canals with tendency to develop blind side branches; gonads sausage-shaped or spiral.

Genus ***Polyorchis*** A. Agassiz 1862

Polyorchidae with four radial canals giving rise to many blind side branches. Tentacles along the whole bell margin, not in clusters, with abaxial ocelli. Gonads sausage-shaped, hanging down from the junction points of the radial canals with the manubrium.

Type-species: *P. penicillatus* (Eschscholtz).

A. AGASSIZ 1862, p. 349: *Polyorchis* n.g.

Polyorchis haplus Skogsberg 1948

15–20 mm high. Gonads about 20–25 on each canal, on entire length of peduncular canals (in fully developed specimens). Radial canals simple, only in large specimens with closely set, knob-like branches. Up to 24 tentacles.

Skogsberg 1948, p. 121: *Polyorchis haplus* n.sp.; California.

Polyorchis karafutoensis Kishinouye 1910

60 mm high, 50 mm wide. Manubrium prismatic. About 10 × 4 sausage-like gonads, irregularly branched, longer than manubrium. Ring canal with branched centripetal canals; radial canals with 16–22 lateral diverticula, long and branched. About 120 tentacles.

Kishinouye 1910, p. 30, Pl. 5, fig. 31: *Polyorchis karafutoensis* n.sp.; Saghalin, N. of Japan. Mayer 1910, p. 723. Uchida 1925*b*, p. 88, fig. 13: Saghalin. Uchida 1927*b*, p. 227: belongs to family Polyorchidae; Saghalin; Hokkaido, Japan. Thiel 1932*a*, p. 140: to family Williadae. Thiel 1932*b*, pp. 441 ff.: distribution. Okuda 1940, p. 73: the pycnogonid *Ammothea alaskensis* as parasite in *P. karafutoensis*. Uchida 1940*a*, p. 288: Japan. Naumov 1956*b*, p. 37.

Polyorchis montereyensis Skogsberg 1948

40 mm high. Up to 45 or more gonads on each peduncular canal. Radial canals with about 25–30 lateral branches on either side. Up to about 80 tentacles.

Skogsberg 1948, p. 114, fig. 2: *Polyorchis montereyensis* n.sp.; California.

Polyorchis penicillatus (Eschscholtz 1829)

50–60 mm high, 30–40 mm wide. Manubrium prismatic, about as long as bell cavity; with short peduncle; 4–11 sausage-shaped gonads on each radial canal. Ring canal simple; radial canals with 15–25 pairs of short lateral diverticula. Up to 160 tentacles.

Eschscholtz 1829, p. 106, Pl. 8, fig. 4: as *Melicertum penicillatum* n.sp.; California. A. Agassiz 1862, p. 349: *Polyorchis penicillata* n.g.; Gulf of Georgia; San Francisco. Mayer 1910, p. 218, fig. 111: (California to Hawaii); p. 219: as *P. minuta* (Vancouver). Little 1914, pp. 307–23, Pl. 13–15: *P. penicillatus* identical with *pinnatus* + *campanulata* Hckl., and *P. minuta* Murb. & Shear. 1903; structure of ocelli. Foerster 1923, p. 250: localities in W. America. Kramp 1928, p. 60: identical with *P. minuta* Murb. & Shear.; Vancouver. Bigelow 1940, p. 296: Gulf of California. Skogsberg 1948, p. 118: as *P. penicillatus*; California.

Genus *Scrippsia* Torrey 1909

Polyorchidae with a large, gelatinous stomachal peduncle, from which numerous sausage-shaped gonads hang down. Four narrow radial canals without lateral diverticula.

Type-species: *S. pacifica* Torrey.

Torrey 1909, p. 15: *Scrippsia* n.g.

Scrippsia pacifica Torrey 1909

75 mm high, deep bell-shaped, with slight apical prominence. Peduncle broadly conical, longer than half of bell cavity, with numerous gonads on radial canals. About 256 tentacles in seven cycles, the longest projecting from the sides of exumbrella, the smallest with abaxial ocelli.

Torrey 1909, p. 15, fig. 3: *Scrippsia pacifica* n.g., n.sp.; California. Mayer 1910, p. 493, fig. 327. Foerster 1923, p. 253: report of Torrey. Uchida 1927*a*, p. 227: *Scrippsia* is included in family Polyorchidae. Skogsberg 1948, p. 108: *Scrippsia*, subgenus of *Polyorchis*.

Genus ***Spirocodon*** Haeckel 1880

Polyorchidae with tentacles in eight marginal clusters. Radial canals and ring canal with branched diverticula. Four perradial gonads attached to stomachal peduncle, hanging down as spirally twisted loops.

Type-species: *S. saltator* (Tilesius 1818).

Haeckel 1880, p. 636: *Spirocodon* n.g.

Spirocodon saltator (Tilesius 1818)

Up to 75 mm high, 65 mm wide. Radial canals very narrow, with numerous dendritic lateral branches; four interradial dendritic centripetal canals from ring canal. Numerous tentacles in eight curved groups, all with abaxial ocelli.

Tilesius 1818, p. 554, Pl. 18: as *Medusa saltatrix* n.sp.; Japan. Haeckel 1880, p. 636: *Spirocodon saltatrix*, = *Polyorchis saltatrix*. Mayer 1910, pp. 220, 724, figs. 112, 427. Okada 1926, p. 76, Pl. 1, figs. 1, 2, text-figs. 1–4: *S. saltatrix*; p. 80: Pl. 1, figs, 3, 4: as *S. brevitentacularis* n.sp.; Japan. Uchida 1927*a*, p. 230, Pl. 10, fig. 9, Pl. 11, text-figs. 1–12, 16–19, 43–6: *S. saltatrix*, = *S. brevitentacularis* Okada 1926 and *Lizzia octella* Hckl.; belongs to new family of Anthomedusae Spirocodonidae; new localities in Japan. Uchida 1927*b*, p. 219: Japan. Kramp 1928, p. 61: Misaki, Japan. Uchida 1938*a*, p. 145: Japan. Uchida 1938*b*, p. 40: Japan. Uchida 1938*c*, p. 50, fig. 2: Japan. Dan & Dan 1947, pp. 163–88, figs. 1–17: cleavage of egg; Misaki, Japan. Kikuchi 1947, pp. 144–146. Kume 1948, pp. 270–1: ovulation. Dan 1950, pp. 412, 415, figs. 1, 2: spawning; Misaki, Japan. Hisada 1956, pp. 529–33, text-figs. 1–3 (diagrams): ocelli; Japan. Uchida 1958, p. 164: Sado, Japan. Yamazi 1958, p. 136: Tanabe Bay, Japan.

Family *TIARANNIDAE*

Anthomedusae without apical projection and without gastric peduncle; with large cruciform stomach; mouth with simple or folded lips; with four simple radial canals; with folded gonads on the walls of the stomach and its perradial lobes; with numerous hollow marginal tentacles with conical basal bulbs; with hollow marginal spindle-shaped cordylus-like structures with nematocysts at distal end; without ocelli. Hydroids unknown.

Genus **Chromatonema** Fewkes 1882

Tiarannidae in which the gonads are eight series of sac-like invaginations from the surface of the perradial stomachal lobes, and separated in the interradii.

Type-species: *C. rubrum* Fewkes.

FEWKES 1882*b*, p. 305: *Chromatonema* n.g. MAYER 1910, p. 199: as *Thaumantias*. KRAMP 1919, p. 7: *Chromatonema* referred to family Laodiceidae. RANSON 1936*b*, p. 102: referred to family Williadae, Anthomedusae. BIGELOW 1938, p. 109: note on systematic position. RUSSELL 1940*a*, p. 518: the genus is united with *Tiaranna* in a new family of Anthomedusae Tiarannidae. KRAMP 1947, p. 52; support to Russell.

Chromatonema erythrogonon (Bigelow 1909)

Diameter up to 44 mm; up to 64 tentacles; 1–2 cordyli between tentacles. Probably = *C. rubrum.*

BIGELOW 1909*a*, p. 150, Pl. 5, fig. 1, Pl. 38, figs. 8, 9, Pl. 39, figs. 1–7: as *Ptychogena erythrogonon* n.sp; Pacific Ocean off Peru. MAYER 1910, p. 217: as *P. erythrogonon.* VANHÖFFEN 1911*a*, p. 220: as *P. erythrogonon*, compared with *P. hertwigi* n.sp. KRAMP 1919, pp. 13–15: *Chromatonema erythrogonon.* BIGELOW 1938, p. 109: notice about development of gonad. BIGELOW 1940, p. 297, fig. 13: Laodiceidae; the species is temporarily retained; Gulf of California to Gulf of Panama. KRAMP 1957*a*, p. 27: probably = *C. rubrum.* KRAMP 1959*a*, p. 31.

Chromatonema hertwigi (Vanhöffen 1911)

Diameter 50 mm; 20 tentacles; five cordyli between tentacles. Probably = *C. rubrum.*

VANHÖFFEN 1911*a*, p. 220, Pl. 22, fig. 9, text-fig. 13*a*, *b*: as *Ptychogena hertwigi* n.sp.; comparison with *P. erythrogonon*; description; between the Nicobars and Ceylon, 2000–0 m. KRAMP 1919, pp. 14, 15: *Chromatonema hertwigi.* KRAMP 1957*a*, p. 27: probably = *C. rubrum.*

Chromatonema rubrum Fewkes 1882

Up to 27 mm wide and 22 mm high, jelly thick, apex evenly rounded. Manubrium broad, quadrangular, with four perradial lobes extending for half or 2/3 the distance towards bell margin; mouth with four short, slightly crenulated lips; 10–16 sac-like gonads on each side of each stomach lobe. 20–24 tentacles with conical bulbs; between successive tentacles two, rarely one, minute cordylus-like appendages with distal bundle of nematocysts.

Fewkes 1882*b*, p. 305, fig. 41, Pl. 1: *Chromatonema rubrum* n.g., n.sp.; New England, U.S.A. Mayer 1910, p. 199: as *Thaumantias rubrum*. ?Vanhöffen 1912, p. 366, Pl. 24, fig. 4: as *Ptychogena aurea* n.sp.; Antarctic. Kramp 1913*a*, p. 267: as *T. rubrum*; Davis Strait. Kramp 1914, p. 419: as *T. rubrum*; Davis Strait. Kramp 1919, p. 7, Pl. 1, figs. 1–8, text-figs. 3, 4*a*, map. 1: referred to family Laodiceidae; northern Atlantic. Kramp 1920*a*, p. 8, Pl. 1, figs. 5, 6: description; discussion of genus and species; Newfoundland Bank. Kramp 1920*b*, p. 4: northern Atlantic. Thiel 1932*a*, p. 141: *C. rubrum* = *P. hertwigi* Vanh. ? = *P. erythrogonon* Bigelow. Thiel 1932*b*, pp. 441 ff.: distribution. Kramp 1933*a*, p. 552, figs. 14, 15: distribution. Ranson 1936*b*, p. 102, Pl. 2, fig. 13: the genus is considered to be an Anthomedusa of the family Williadae; W. of Azores. Russell 1937, p. 680: a medusa from the Channel seems to be *C. rubrum*. Bigelow 1938, p. 109: notice about the systematic position; Bermuda. Russell 1940*a*, p. 518: description of nematocysts; is united with *Tiaranna rotunda* in a new family of Anthomedusae, Tiarannidae; W. of Ireland. Kramp 1942, p. 51: discussion of the systematic position; W. Greenland. Kramp 1947, p. 52, Pl. 6, fig. 7: support to Russell 1940*a*; northern Atlantic. Fraser 1950, pp. 94, 95: as *Cromatonema rubra*; northern North Sea. Russell 1953, p. 223, text-figs. 120, 121: west of Ireland. Kramp 1957*a*, pp. 25, 99, 126, text-fig. 5: *C. erythrogonon*, *hertwigi* and *Ptychogena aurea* Vanh. probably = *C. rubrum*; W. of Cape of Good Hope; Antarctic. Kramp 1957*b*, pp. 155, 162: Antarctic Sea. Petersen 1957, p. 34, text-fig. 4: northern Atlantic Ocean. Kramp 1959*a*, pp. 31, 130, 253–6, 259, 261, 263, fig. 144: Gulf of Panama; diagnosis; distribution.

Genus ***Modeeria*** Forbes 1848

With four perradial (perhaps also four interradial) tentacles and numerous rudimentary bulbs. Manubrium on a short peduncle. Gonads smooth. Mouth-lips simple, smooth.

Type-species: *M. formosa* Forbes.

Forbes 1848, p. 70: *Modeeria* n.g.

Modeeria formosa Forbes 1848

Doubtful species. ? = *Tiaranna rotunda.*

Forbes 1848, p. 70, Pl. 7, fig. 1: *Modeeria formosa* n.g., n.sp.; Hebrides, Scotland. Mayer 1910, p. 147: ? = *Oceania armata* Kölliker. Hartlaub 1913, p. 253, fig. 210: *M. formosa* non = *O. armata.*

Genus ***Tiaranna*** Hartlaub 1913

Tiarannidae in which the gonads are lateral folds on both sides of the perradial stomachal lobes and connected in the interradii.

Type-species: *T. rotunda* (Quoy & Gaimard) Hartlaub.

Hartlaub 1913, p. 265: *Tiaranna* n.g., = *Tiara* in part. Russell 1940*a*, p. 518: *Tiaranna* type-genus of family Tiarannidae, Anthomedusae.

Tiaranna ducalis (Forbes & Goodsir 1853)

Doubtful species.

Forbes & Goodsir 1853, p. 311, Pl. 10, fig. 2: as *Oceania ducalis* n.sp.; W. Scotland; English Channel. Hartlaub 1913, p. 270, fig. 222: as *Tiaranna ducalis* = *Oceania ducalis*. Russell 1953, p. 483, fig. 317: as *O. ducalis*; doubtful species.

Tiaranna globulosa (Forbes 1848)

Doubtful species.

Forbes 1848, p. 29, Pl. 3, fig. 3: as *Oceania globulosa* n.sp.; Shetland Islands. Mayer 1910, p. 122: ? = young specimen of *Turris neglecta*. Hartlaub 1911, p. 203: ? = *Turritopsis polycirrha*. Hartlaub 1913, p. 362, fig. 311: *Tiaranna globulosa*. Russell 1953, p. 484, fig. 318: as *O. globulosa*; doubtful species. Kramp 1959*a*, p. 130.

Tiaranna ikarii Uchida 1927 *

4 mm high, 4·2 mm wide; thick, evenly rounded. Manubrium large and wide, stomach quadrate, mouth wide. Gonads complicated, irregular, interradial. Radial canals wide and jagged. Four large perradial and four smaller interradial tentacles, and 12 rudimentary knobs, all with ocelli. Evidently the species does not belong to *Tiaranna*.

Uchida 1927*a*, p. 208, fig. 35: *Tiaranna ikarii* n.sp.; Japan. Yamazi 1958, p. 136: Tanabe Bay, Japan.

Tiaranna rotunda (Quoy & Gaimard 1827)

About 20 mm wide, somewhat less in height; jelly thick, apex evenly rounded. Manubrium broad, cruciform, perradial edges of stomach in their entire length connected with subumbrella; mouth with four large, slightly crenulated lips; gonads in regular transverse folds on interradial walls of stomach extending outwards along the perradii. 16–28 tentacles with conical bulbs; between successive tentacles 2–3 minute spindle-shaped cordylus-like appendages with distal bundle of nematocysts.

Quoy & Gaimard 1827, p. 181, Pl. 6*a*, figs. 1, 2: *Dianaea rotunda* n.sp.; Straits of Gibraltar. Maas 1910, p. 8: as *Tiara rotunda*; description; found again at Gibraltar. Mayer 1910, p. 124: as *Turris rotunda*. Hartlaub 1913, p. 266, figs. 218, 219: *Tiaranna rotunda* n.g.; N. North Sea. Hartlaub 1917, p. 411, figs. 341–3: as *Rotundula brochii* n.g., n.sp.; (abnormal specimen from Trondheim Fjord, Norway). Kramp 1920*a*, p. 6, Pl. 1, figs. 2–4: Gibraltar. Kramp 1924, p. 5: Gibraltar. Kramp & Damas 1925, p. 275, figs. 21–2: *Rotondula brochii* = *T. rotunda*; Norway. Kramp 1926*a*, p. 68. Kramp 1927, p. 86: Skagerrak. Runnström 1932, p. 28: Herdlafjord, Norway. Ranson 1936*b*, p. 64: discussion of genus; p. 67, Pl. 1, figs. 10–11: Mediterranean. Kramp 1937*b*, p. 60, fig. 24: Denmark. Russell 1940*a*, p. 517: nematocysts; p. 518: united with *Chromatonema* to the new family of Anthomedusae, Tiarannidae. Kramp 1942, p. 36: map of distribution; W. Greenland. Kramp 1947, p. 50: map of distribution; Irminger Sea. Russell 1953, p. 219, figs. 117–19. Lubet 1954, p. 213: as *Tiara*; Arcachon, France. Kramp 1957*a*, pp. 25, 99, 126, text-fig. 5: tropical Atlantic; Antarctic. Petersen 1957, p. 34: northern Atlantic. Edwards 1958, p. 1565: Firth of Clyde, Scotland. Kramp 1959*a*, pp. 31, 130, 253, 255, 256, 259, 260, 261, 263, fig. 143: Straits of Gibraltar (new record); diagnosis; distribution.

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* See Addenda, p. 444.

Tiaranna sagamina Uchida 1947

Size unknown. Jelly very thick. Seems to lack ring canal. 12 tentacles. Gonads not yet developed. Otherwise like *T. rotunda*.

UCHIDA 1947*b*, p. 334, fig. 2: *Tiaranna sagamina* n.sp.; Sagami Bay, Japan.

Order LEPTOMEDUSAE

Hydromedusae with umbrella usually hemispherical or flattened; with gonads on radial canals; marginal sense organs, when present, in form of cordyli or marginal vesicles of ectodermal origin; occasionally with ocelli.

Family *DIPLEUROSOMATIDAE*

Leptomedusae without any kind of marginal sense organs; with stomach with narrow base; with three, four or more radial canals either branched or, if simple, irregularly arranged; with gonads on radial canals separated from stomach; with hollow marginal tentacles; without marginal or lateral cirri. Hydroids, where known, *Cuspidella*-like.

Genus ***Cannota*** Haeckel 1879

Dipleurosomatidae with four radial canals, each giving rise to two simple, unbranched side branches, which join the ring canal on either side of the main canal; 12 gonads on the four main canals and side branches.

Type-species: *C. dodecantha* Haeckel.

HAECKEL 1879, p. 151: *Cannota* n.g.; belongs to the family Cannotidae, subfamily Berenicidae. MAYER 1910, p. 221: belongs to the family Thaumantiadae, subfamily Berenicinae.

Cannota dodecantha Haeckel 1879

4 mm high and wide, flatly conical. Stomach cubic, mouth with four small, folded lips. On the four radial canals two side branches, leaving the main canal on the middle, and forming a right angle with it; the side branches join the ring canal at equal distances from the main canals. Along the distal parts of the canals 12 spindle-shaped gonads. 12 long tentacles.

HAECKEL 1879, p. 151: *Cannota dodecantha* n.g., n.sp.; Gulf of Guinea. MAYER 1910, p. 221: *C. dodecantha* = *Staurodiscus nigricans* Ag. & Mayer 1899. KRAMP 1955*a*, p. 307: *C. dodecantha* is not = *Staurodiscus nigricans*. KRAMP 1959*a*, pp. 133, 227, 228: diagnosis; distribution.

Genus ***Cuvieria*** Péron 1807

Dipleurosomatidae with four main radial canals, which branch repeatedly, all branches joining ring canal; gonads on terminal branches of canals.

Type-species: *C. carisochroma* Péron.

PÉRON 1807, p. 30: *Cuvieria* n.g. MAYER 1910, p. 221: *Cuvieria* = *Berenice* Eschscholtz 1829, subfamily Berenicinae, family Thaumantiadae.

Cuvieria carisochroma Péron 1807

20–50 mm wide, flatter than a hemisphere. Stomach small, mouth with four short lips. In the middle of each of the four radial canals one pair of lateral branches; these as well as the main canal are further profusely branched in their distal portion, 50–60 or more canals joining ring canal. 50–100 or more long tentacles.

PÉRON 1807, Pl. 30, figs. 2, 2*a*: *Cuvieria carisochroma* n.g., n.sp.; equatorial Atlantic Ocean. HAECKEL 1879, p. 154, Pl. 9, fig. 5: as *Berenice capillata* n.sp.; Cape Verde Islands. MAYER 1910, p. 222, fig. 114. KRAMP 1955*a*, p. 308: *Berenice capillata* = *C. carisochroma.* KRAMP 1959*a*, pp. 133, 224, 226, fig. 150: diagnosis; distribution.

Cuvieria huxleyi (Haeckel 1879)

16 mm wide, 4 mm high. Stomach small, four short lips; about 70 terminal branches of radial canals. 16 long tentacles with ocelli; 80–100 marginal ' clubs '.

HAECKEL 1879, p. 154, Pl. 9, fig. 4: as *Berenice huxleyi* n.sp.; Azores. MAYER 1910, p. 222, fig. 115: *Cuvieria huxleyi*, ? = *C. carisochroma.* KRAMP 1959*a*, p. 134: the species either belongs to *Toxorchis* (Laodiceidae) or *Cuvieria* and may even be identical with *C. carisochroma.*

Genus ***Dichotomia*** Brooks 1903

Dipleurosomatidae with four main radial canals once bifurcating into two diverging branches, each of which gives rise to lateral branches all reaching ring canal; gonads adjacent to stomach extending outwards along the canals and their branches.

Type-species: *D. cannoides* Brooks.

BROOKS 1903, p. 11: *Dichotomia* n.g. MAYER 1910, p. 223: *Dichotomia* member of the subfamily Berenicinae, family Thaumantiadae.

Dichotomia cannoides Brooks 1903

8 mm high, 6 mm wide, with conical apex; the four main radial canals arise in pairs from the ends of a short transverse canal; they are divided near the base of the stomach into two widely diverging branches, each giving rise to lateral branches, so that about 32 canals join the ring canal. Up to 50 tentacles of different sizes, densely crowded.

BROOKS 1903, p. 11, Pl. 1, figs. 1–3: *Dichotomia cannoides* n.g., n.sp.; Bahama Islands. MAYER 1910, p. 223, fig. 116. MOORE 1949, p. 6: Bermuda Islands. KRAMP 1959*a*, pp. 32, 133, 232, figs. 6*a*, *b*, 149: new description; West Indies and off New England, U.S.A.

Genus ***Dipleurosoma*** Boeck 1866

Dipleurosomatidae with three or more main radial canals, some or all of which branch irregularly (not regularly and dichotomously) and join the circular canal. Gonads on proximal parts of the radial canals adjacent to manubrium. Tentacles numerous; ocelli may be present.

Type-species: *D. typicum* Boeck.

Boeck 1866, p. 131: *Dipleurosoma* n.g. Mayer 1910, p. 224: *Dipleurosoma*, member of the subfamily Berenicinae, family Thaumantiadae. Russell 1953, p. 251: *Dipleurosoma*, member of family Dipleurosomidae.

Dipleurosoma collapsum (Mayer 1900)

7 mm high and broad, apex dome-shaped, side walls vertical. Stomach on a large and prominent peduncle, mouth with eight slightly crenulated lips; 16 radial canals in four groups of four each. 16 well developed and 112 rudimentary tentacles, all with endodermal pigment spots.

Mayer 1900*b*, p. 46, Pl. 7, 8, figs. 14–16: as *Tetracannota collapsa* n.g., n.sp.; Tortugas, Florida. Mayer 1910, p. 226, Pl. 27, figs. 1–3, 7: *Dipleurosoma collapsa*. Vanhöffen 1913*a*, p. 420: Tortugas, Florida (new record). Kramp 1959*a*, pp. 132, 231, fig. 147: diagnosis; distribution; systematic position uncertain.

Dipleurosoma ochraceum Mayer 1910

8 mm wide, flatter than a hemisphere, thin. Stomach flat, mouth with six or more lips. About 6–9 radial canals, irregular, partly branched. Gonads not observed. 12–16 well developed and about 35 rudimentary tentacles, with hollow, conical bulbs, each bulb flanked by a pair of large club-shaped appendages and with one sausage-shaped diverticulum above each tentacle-bulb; ocelli not observed.

Mayer 1910, p. 226, Pl. 29, figs. 1, 2: *Dipleurosoma ochracea* n.sp.; Tortugas, Florida. Vanhöffen 1913*a*, p. 421, fig. a: Tortugas. Kramp 1959*a*, pp. 132, 231, fig. 146: diagnosis; distribution.

Dipleurosoma pacificum Agassiz & Mayer 1902

23 mm wide. Exumbrella reticulated by hexagonal elevations. Manubrium very short, six small lips. Six radial canals in groups of three, two of which bifurcate. Gonads in the middle regions of the eight canals. About 100 short tentacles with solid (!) chordate endoderm, with adaxial ocelli. Slender club-shaped bodies scattered between tentacles.

Agassiz & Mayer 1902, p. 148, Pl. 3, figs. 13, 14: *Dipleurosoma pacifica* n.sp.; north of Tahiti, Pacific Ocean. Mayer 1910, p. 225, fig. 118.

Dipleurosoma typicum Boeck 1866

8–12 mm wide, flatter than a hemisphere. Stomach very variable in shape; 5–18 main radial canals, simple or irregularly branching, narrow; 1–12 gonads, most frequently five, on proximal parts of radial canals. More than 100 tentacles, each with an adaxial ocellus.

Boeck 1866, p. 131, figs. 1–3: *Dipleurosoma typicum* n.g., n.sp.; Norway; p. 136, figs. 1–4: *D. stuvitzii* n.sp.; Newfoundland. Mayer 1910, p. 224, fig. 117: *D. typicum* = *D. stuvitzii* Boeck, *D. amphithectum, D. irregulare* Haeckel, *D. hemisphaerica* Haddon; (North Europe; Newfoundland). Kramp 1919, p. 57. Thiel 1932*a*, p. 144. Thiel 1932*b*, p. 442 ff.: distribution. Kramp 1933*a*, p. 562, fig. 24: distribution and synonyms. Kramp 1937*b*, p. 88, fig. 37. Russell 1940*a*, p. 519, figs. 22, 23: nematocysts; Valentia, Ireland. Russell 1953, pp. 251, 256, figs. 143–6: British coasts; *D. amphithectum* Hckl. is temporarily kept distinct. Vanucci 1956*b*, p. 249: Clyde Sea, Scotland. Kramp 1959*a*, pp. 132, 211, 212, 215, 218, fig. 145: diagnosis; distribution. Werner 1959*a*, pp. 33, 36: Port Erin, Isle of Man.

Family *MELICERTIDAE*

Leptomedusae without any kind of marginal sense organs; with base of stomach attached over its whole surface; with eight simple or bifurcated radial canals; with hollow marginal tentacles; without marginal or lateral cirri; with or without ocelli. Hydroids, where known, hydranth naked, with single whorl of filiform tentacles.

Genus ***Melicertoides*** Kramp 1959

Melicertidae with eight simple radial canals, four primary and four secondary, the latter developed centripetally from the ring canal; with gonads adjacent to stomach.

Type species: *M. centripetalis* Kramp.

Kramp 1959*c*, p. 238: *Melicertoides* n.g.

Melicertoides centripetalis Kramp 1959

1 mm high, higher than wide, jelly thin. Stomach broad and swollen, mouth opening simple; eight radial canals, all alike and fairly broad, with funnel-shaped openings into the middle zone of the stomach; gonads (immature) small, adjacent to stomach. Four perradial tentacles opposite to the four primary radial canals; 12 other tentacles irregularly scattered.

Kramp 1959*c*, p. 239, figs. 10, 11: *Melicertoides centripetalis* n.g., n.sp.; development; Philippines.

Genus ***Melicertum*** L. Agassiz 1862

Melicertidae with eight simple radial canals, four primary and four secondary which arise from the stomach; with gonads on the radial canals separated from stomach; usually (? always) without ocelli.

Type-species: *M. octocostatum* (M. Sars).

L. Agassiz 1862, pp. 349, 352: *Melicertum* n.g. Mayer 1910, p. 207: *Melicertum* = *Melicertidium* Hckl., belongs to subfamily Melicertinae, family Thaumantiadae. Kramp 1919, p. 47: *Melicertum* = *Melicertidium*; discussion of the name and species. Gemmill 1921*a*, p. 344: *Melicertum* non = *Melicertidium*. Russell 1953, p. 245: *Melicertum* belongs to family Melicertidae.

Melicertum georgicum A. Agassiz 1862

20 mm high and wide. Stomach, wide, flat and octagonal; mouth long with four (?) lips. Eight gonads covering nearly the entire length of the eight radial canals, but not touching the ring canal. About 30–40 tentacles with large basal bulbs. Ocelli?

Agassiz 1862, p. 349: *Melicertum georgicum* n.sp.; Pacific coast of North America. Mayer 1910, p. 209: *M. georgicum* possibly = *M. campanula*. Foerster 1923, p. 249.

Melicertum octocostatum (M. Sars 1835)

11–14 mm high and wide, conical to pyriform, thick, solid apex and thinner sides. In each octant 5–7 fine lines of nematocysts upon subumbrella. Velum narrow. Stomach short and broad, octagonal, eight small lips. Eight sinuous, linear gonads almost to bell margin. About 64–72 large tentacles alternating with as many small ones; no ocelli.

Sars 1835, p. 24, Pl. 4, figs. 9*a–d*: as *Oceania octocostata* n.sp.; Norway. Mayer 1910, p. 207, Pl. 23, figs. 4, 5, Pl. 24, fig. 5: as *M. campanula*; New England; p. 208: *M. octocostatum*; (N.W. Europe). Bigelow 1914*a*, p. 125: as *M. campanula*; Gulf of Maine. Bigelow 1914*b*, p. 11: as *M. campanula*; belongs to the family Thaumantiadae; New England. Bigelow 1915*b*, p. 316: as *M. campanula*; Gulf of Maine. Bigelow 1917, p. 303: as *M. campanula*; Gulf of Maine. Kramp 1919, p. 52, Pl. 1, fig. 10, Pl. 3, fig. 8, chart V: *M. octocostatum*; northern Atlantic; p. 57: as *M. campanula*. Gemmill 1920, p. 459, fig.: ciliation. Gemmill 1921*a*, p. 339, Pl. 16: development; p. 344: *Melicertum* non = *Melicertidium*; the radiating lines on *Melicertidium* are presumed not to be nematocysts, but muscle-fibres. Sverdrup 1921, p. 22, Pl. 4, fig. 15: Kristianiafjord, Norway. Bigelow 1922, p. 134: as *M. campanula*; south of Cape Cod. Elmhirst 1923, p. 20: medusa and hydroid; Clyde Sea, Scotland. Foerster 1923, p. 249: as *M. campanula*; Vancouver. Kramp & Damas 1925, p. 294: Norway. Marshall 1925, p. 127: Clyde, Scotland. Bigelow 1926, pp. 33, 341: as *M. campanula*; Gulf of Maine, U.S.A. Fish 1926, p. 123: as *Milercertium campanula*; Woods Hole, U.S.A. Kramp 1927, p. 108: Denmark. Uchida 1927*b*, p. 220, fig. 1: as *M. campanula*; without subumbrellar nematocyst lines; Japan. Runnström 1932, p. 28: Herdla- and Hjeltefjord, Norway. Thiel 1932*a*, p. 143: as *M. octocostatum* and *M. campanula*. Thiel 1932*b*, pp. 442 ff.: as *M. octocostatum* and *M. campanula*; distribution. Kramp 1933*a*, p. 562, figs. 25, 26: distribution; synonyms. Kramp 1933*c*, p. 237: *M. campanula* = *M. octocostatum*. Ranson 1933*c*, p. 316: as *Melicertidium octocostatum*; Bergen, Norway. Künne 1935, p. 65: Baltic Sea. Kramp 1937*b*, p. 86, fig. 36: Denmark. Künne 1937*b*, p. 6: Baltic Sea. Uchida 1938*b*, p. 41: Japan. Kramp 1939*a*, p. 12: Iceland. Russell 1940*a*, p. 520, figs. 24, 25, 26, 27: nematocysts. Uchida 1940*a*, p. 289: Japan. Kramp 1942, p. 57: W. Greenland. Yashnov 1948, p. 72, Pl. 20, fig. 3: Barents Sea. Rees 1953*a*, p. 8: Herdlafjord, Norway. Russell 1953, p. 245, Pl. 13, figs. 2–4, text-figs. 138–42: doubtful if *M. octocostatum* *M. campanula*, as the hydroids are different; British coasts. Chiu 1954*b*, p. 56: as *M. campanula*. Naumov 1956*b*, p. 37: as *M. campanula*. Vannucci 1956*b*, pp. 245, 248: Clyde Sea, Scotland. Kramp 1959*a*, pp. 134, 208, 209, 211, 215, 216, 218, 219, 221, 271, fig. 152: diagnosis; distribution. Werner 1959*a*, p. 33: Port Erin, Isle of Man.

Melicertum panocto (Haeckel 1879)

10 mm high, 8 mm wide. Stomach octagonal with eight long, much-folded lips. Eight spindle-shaped gonads upon entire length of the eight radial canals. Eight long tentacles with very large, globular bulbs, each with a black ocellus flanked by two half-moon-shaped spots. Doubtful species.

Haeckel 1879, p. 135: as *Melicertella panocto* n.g., n.sp.; Azores. Mayer 1910, p. 209: as *Melicertum panocto*; possibly = *Melicertissa clavigera*. Kramp 1959*a*, p. 135: ?mutilated specimen of *Melicertissa clavigera*.

Genus ***Netocertoides*** Mayer 1900

Melicertidae with eight main radial canals bifurcating once. Gonads on main radial canals adjacent to stomach. Without ocelli.

Type-species: *N. brachiatus* Mayer.

Netocertoides brachiatus Mayer 1900

4–5 mm high, higher than wide. Stomach broad and disk-like, mouth with four simple lips; eight main radial canals bifurcated once. 16 long, hollow tentacles opposite the 16 canals. 16–25 small tentacles.

Mayer 1900*b*, p. 45, Pl. 18, figs. 43–4: *Netocertoides brachiatum* n.g., n.sp.; Bahamas; Florida. Mayer 1910, p. 229, Pl. 27, figs. 4–6. Kramp 1959*a*, pp. 133, 231, fig. 148: diagnosis; distribution. Kramp 1959*c*, p. 238: referred to Melicertidae.

Genus ***Orchistomella*** Kramp 1959*

Melicertidae with eight or more simple radial canals, all of which arise from the stomach; with or without ocelli; gonads?

Type-species: *O. tentaculata* (Mayer).

Kramp 1959*c*, p. 241: *Orchistomella* n.g., to comprise two species formerly referred to *Orchistoma*, and a new species.

Orchistomella applanata Kramp 1959

1·5 mm wide, flat-topped, jelly fairly thick, a gelatinous plug extending downwards into the centre of the very broad stomach; mouth broad, with four broad lips; eight simple radial canals; gonads not observed. Eight large tentacles with very large, almost globular bulbs, each with an adaxial, black ocellus; one or two rudimentary bulbs between successive tentacles.

Kramp 1959*c*, p. 242, fig. 12: *Orchistomella applanata* n.sp.; Philippines.

* See Addenda, p. 444.

Orchistomella graeffei (Neppi & Stiasny 1911)

4 mm wide, highly vaulted, apical jelly very thick; peduncle?. Stomach quite flat, mouth with eight simple lips; eight fully developed radial canals and in each octant about 12 young, blindly ending canals. Eight tentacles with large, pear-shaped bulbs; 2–3 rudimentary bulbs between successive tentacles.

Neppi & Stiasny 1911, p. 397: *Orchistoma graeffei* n.sp.; Trieste. Neppi & Stiasny, 1913*b*, p. 61: description. Kramp 1959*a*, pp. 140, 223; diagnosis; distribution. Kramp 1959*c*, p. 241: *Orchistomella graeffei.*

Orchistomella tentaculata (Mayer 1900)

6 mm high, higher than wide; apical jelly very thick, sides thin; no peduncle. Stomach very broad and flat, eight lips. 16 fully developed and 16 short, blind radial canals; gonads not observed. 32 tentacles of unequal length.

Mayer 1900*a*, p. 8, Pl. 5, fig. 19: *Orchistoma tentaculata* n.sp.; Newport, Rhode Island, east coast of U.S.A. Mayer 1910, p. 212, Pl. 24, fig. 1. Bigelow 1914*b*, p. 12. Kramp 1933*a*, p. 564, fig. 27. Kramp 1959*a*, pp. 34, 140, 211, 213, fig. 164: N.E. of Bermudas (new record); diagnosis; distribution; systematic position doubtful. Kramp 1959*c*, p. 241: *Orchistomella tentaculata* n.g.

Family *TIMOIDIDAE* nov. fam.

Leptomedusae without any kind of marginal sense organs; ring canal with blindly ending centripetal canals; with stomach upon a peduncle.

Genus ***Timoides*** Bigelow 1904

Timoididae with four radial canals; with numerous tentacles and marginal cirri.

Type-species: *T. agassizi* Bigelow.

Timoides agassizi Bigelow 1904

20 mm wide, 14 mm high, apex very thick. Stomach very long; four long, lancet-shaped, complexly folded lips. Peduncle twice as long as the bell cavity, with flaring base. Gonads on lower half of peduncle, above stomach, four ridges of papilliform processes. 12 interradial and adradial centripetal canals. 32 tentacles; numerous marginal cirri, no lateral cirri.

Bigelow 1904, p. 254, Pl. 3, figs. 10, 11: *Timoides agassizi* n.g., n.sp.; Maldive Islands, Indian Ocean. Mayer 1910, p. 212, fig. 108.

Family *LAODICEIDAE*

Leptomedusae with marginal cordyli; with 4–8 or more simple or branched radial canals; with hollow marginal tentacles; with or without marginal cirri; without marginal vesicles; with or without ocelli. Hydroids: *Cuspidella*-like.

Genus ***Krampella*** Russell 1957

? Laodiceidae with four simple radial canals, and cross-shaped mouth.
Type-species: *K. dubia* Russell.

Russell 1957*b*, p. 445: *Krampella* n.g.; systematic position uncertain, possibly to Laodiceidae but no cordyli present.

Krampella dubia Russell 1957

3 mm wide, hemispherical; four broad radial canals connected with the exumbrella surface by several fine strands of tissue running through the jelly. Gonads along almost whole length of radial canals, widely separated longitudinally. Four perradial and four interradial tentacles with swollen conical basal bulbs; 3–4 small cirrus-like tentacles between successive large tentacles; cordyli, ocelli and marginal vesicles cannot be seen.

Russell 1957*b*, p. 445, text-figs. 1, 2: *Krampella dubia* n.g., n.sp.; Bay of Biscay. Kramp 1959*a*, p. 141, fig. 168*b*: diagnosis. Vannucci 1957*d*, p. 57.

Genus ***Laodicea*** Lesson 1843

Laodiceidae with four simple radial canals; with simple wavy gonads; with or without marginal cirri; with adaxial ocelli.
Type-species: *L. undulata* (Forbes & Goodsir).

Lesson 1843, p. 294: *Laodicea* n.g. Mayer 1910, p. 201.

Laodicea chapmani Günther 1903

17 mm wide, 12 mm high. Gonads somewhat nearer to stomach than to bell margin, not touching the sides of the stomach. 32 tentacles; ocelli only on the four perradial tentacles; cirri and cordyli not observed. Doubtful species.

Günther 1903, p. 425, Pl. 9, figs. 1–3: *Laodicea chapmani* n.sp.; W. of Ireland. Mayer 1910, p. 206: =?abnormal specimen of *L. cruciata*. Kramp 1959*a*, p. 136: doubtful species.

? *Laodicea eucope* (Haeckel 1879)

5 mm wide, hemispherical. Stomach with four short lips. Four ribbon-like, folded gonads on entire length of canals. Eight equal tentacles with

thick, globular bulbs, with abaxial ocelli, 60–80 marginal clubs; 30–40 spiral cirri. Systematic position doubtful.

HAECKEL 1879, p. 127: as *Octonema eucope* n.g., n.sp.; Hawaiian Islands. MAYER 1910, p. 206: *Laodicea? eucope.*

Laodicea fertilis (von Lendenfeld 1884)

2·5 mm high, 2 mm wide. Stomach a four-sided pyramid, four simple lips. Gonads complexly folded, over entire length of the four radial canals, fused on sides of stomach. Eight tentacles; eight very large adradial clubs.

VON LENDENFELD 1884*a*, p. 919, Pl. 42, figs. 14–15: as *Octorhopalon fertilis* n.g., n.sp.; Sydney, Australia. MAYER 1910, p. 206: *Laodicea? fertilis.* KRAMP 1953, p. 310: examination of the type-specimen shows that the species must be retained as a good species of *Laodicea,* but von Lendenfeld's figures are misleading. VANNUCCI 1957*d*, p. 57.

Laodicea fijiana Agassiz & Mayer 1899

4–5 mm high, 12–20 mm wide. Gonads upon short lateral diverticula. About 70 tentacles without basal spur; very few cordyli; no cirri.

AGASSIZ & MAYER 1899, p. 163, Pl. 3, figs. 9, 10: *Laodicea fijiana* n.sp.; Fiji Islands, Pacific Ocean. MAYER 1910, p. 205: *L. fijiana,* =*Laodice fijiana* (var. *indica*?) Maas 1905, 1906*a*. KRAMP 1919, p. 22. KRAMP 1953, p. 269: *L. fijiana* is retained, but only for the specimens from Fiji Islands; *L. fijiana* Maas 1905, 1906*a*, synonym of *L. indica.*

Laodicea indica Browne 1905

Up to 20 mm wide; very like *L. undulata.* Tentacles without a basal spur. Cirri present. One cordylus between every two tentacles.

BROWNE 1905*b*, p. 136, Pl. 1, fig. 5, Pl. 4, figs. 7–11: *Laodice indica* n.sp.; Ceylon. MAAS 1905, p. 25, Pl. 2, figs. 14, 15, Pl. 5, figs. 32–5: as *L. fijiana* var. *indica*?; Malayan Archipelago. MAAS 1906*a*, p. 89: as *L. fijiana*; Amboina, Malayan Archipelago. BROWNE 1907, p. 266: *L. maasi,* nov. nom. for *L. fijiana* var. *indica* Maas. MAYER 1910, p. 202: synonym of *L. cruciata.* VANHÖFFEN 1911*a*, p. 221, fig. 14: as *Laodice maasii* Browne 1907; Gulf of Aden, Arabia. APSTEIN 1913, p. 612: as *L. fijiana*; development of gonads. MAYER 1915*a*, p. 200: as *L. fijiana*; Torres Straits, N. of Australia. KRAMP 1919, p. 22: as *L. maasii*; *L. indica* probably =*L. undulata.* NAIR 1951, p. 59: as *L. undulata* var. *indica*; Trivandrum coast, India. KRAMP 1953, p. 268: type specimen examined; list of synonyms; *L. fijiana* Maas 1905, 1906*a*, probably =*L. indica*; survey of distribution: Ceylon; Malayan Archipelago; Amboina, Banda Sea; Gulf of Aden; Torres Straits; new locality: Great Barrier Reef, Australia. KRAMP 1958*b*, p. 343: Nicobars, Indian Ocean.

Laodicea marama Agassiz & Mayer 1899

Resembling *L. indica,* but usually 2–3 cordyli between every two tentacles. Cirri present. Tentacles without basal spur.

AGASSIZ & MAYER 1899, p. 162, Pl. 3, figs. 7–8: *Laodicea marama* n.sp.; Fiji Islands, Pacific Ocean. MAYER 1910, p. 202: synonym of *L. cruciata.* KRAMP 1919, p. 22: synonym of *L. undulata.* KRAMP 1953, p. 269: *L. marama* is retained.

Laodicea minuscula Vannucci 1957

1 mm wide. Stomach small, with four simple lips. Gonads large, longitudinally divided, extending from stomach almost to ring canal. Four perradial tentacles with large bulbs; four small interradial bulbs; eight cordyli and a few cirri; ocelli not observed.

VANNUCCI 1957*d*, pp. 56, 90, 98, 99, 102, figs. 4, 5: *Laodicea minuscula* n.sp.; Brazil; comparison with other species.

Laodicea neptuna Mayer 1900

2·5 mm wide, a little higher than a hemisphere. Stomach long and wide, lips surrounded by four prominent clusters of nematocysts. Gonads on proximal portion of radial canals, adjacent to stomach. Eight short tentacles with large bulbs and eight rudimentary bulbs; 16 ocelli on marginal bulbs. Numerous nematocyst-bearing cirri; no cordyli. Doubtful species.

MAYER 1900*b*, p. 48, Pl. 20, figs. 50–2: *Laodicea neptuna* n.sp.; Tortugas, Florida. MAYER 1910, p. 206, Pl. 26, figs. 1–3: *Laodicea? neptuna*. VANNUCCI 1957*d*, p. 57. KRAMP 1959*a*, p. 136, fig. 156: diagnosis; probably not a *Laodicea*.

Laodicea ocellata Babnik 1948

3·5 mm wide, globular, thin. Lips short, not undulated. Thick club-shaped gonads along proximal part of radial canals. 7–14 tentacles and 10–18 rudimentary bulbs; very large, black ocelli on all bulbs. Doubtful species.

BABNIK 1948, p. 23, figs. 4, 5: *Laodicea ocellata* n.sp.; Adriatic Sea; pp. 69, 72: diagnosis, biological remarks. VANNUCCI 1957*d*, p. 57. KRAMP 1959*a*, p. 136, fig. 155: diagnosis; doubtful species.

Laodicea pulchra Browne 1902

15 mm high, 25 mm wide. Stomach very large, with four large, perradial lobes extending more than half-way to bell margin; four large, slightly folded lips. Gonads from near centre of stomach nearly to ring canal, with numerous lateral folds. About 50 tentacles without basal spur. No cirri. 3–4 cordyli between every two tentacles, with nematocysts. Adaxial ocelli on each tentacle bulb and cordylus.

BROWNE 1902, p. 280: *Laodice pulchra* n.sp.; Falkland Islands. MAYER 1910, p. 205: *Laodicea pulchra,* ? = *L. cruciata*. KRAMP 1919, p. 24. THIEL 1938*c*, p. 323: *L. pulchra,* ? = *L. undulata*; discussion. BROWNE & KRAMP 1939, p. 291, Pl. 16, figs. 3–5: new description; Falkland Islands. KRAMP 1953, p. 269; *L. pulchra* is a valid species. KRAMP 1957*a*, pp. 27, 96, 124, Pl. 4, fig. 7: variation; southern Patagonia; Falkland Islands. KRAMP 1957*b*, pp. 157, 162: Kerguelen Islands. VANNUCCI 1957*d*, p. 57. KRAMP 1959*a*, pp. 136, 235, 237, 269, fig. 154: diagnosis; distribution.

Laodicea undulata (Forbes & Goodsir 1853)

Up to 37 mm wide, usually much smaller; flatter than a hemisphere.

Stomach quadratic, short, with four crenulated lips; four long, sinuous gonads upon the four radial canals, contiguous with stomach. Up to 400–600 tentacles, basal bulbs faintly developed, young tentacle bulbs with abaxial endodermal spur. Adaxial ocellus usually on each third to fifth tentacle; spiral cirri, usually one between successive tentacles; cordyli distinctly club-shaped, without nematocysts, usually one between successive tentacles.

Forbes & Goodsir 1853, p. 313, Pl. 10, fig. 7: as *Thaumantias undulata* n.sp. Mayer 1910, p. 201, Pl. 21, figs. 4, 5, Pl. 22, figs. 2–6, Pl. 23, figs. 1–3, text-figs. 104, 105: as *L. cruciata*; coast of N. America from Massachusetts to West Indies; (European Atlantic coasts; Mediterranean). Hadži 1911*c*, p. 202, fig. 47: as *L. cruciata*; Adriatic Sea. Neppi & Stiasny 1911, p. 396: as *L. bigelowi* n.sp.; Trieste. Neppi 1912, p. 724, Pl. 2, fig. 7: as *L. cruciata*; discussion of species; Dalmatia, Adriatic Sea. Vanhöffen 1912, p. 365: *Laodice undulata*; Cape Verde Islands. Le Danois 1913*a*, p. 111: as *Staurostoma laciniatum* var. *hybridum* n.var.; preliminary description. Le Danois 1913*b*, p. 19, fig. 6: as *S. laciniatum hybridum*; Little Minch, Scotland; S.W. of Ireland. Le Danois 1913*d*, p. 310: as *S. laciniatum* var. *typicum* and var. *hybridum*; off Douarnenez, Bretagne; Bay of Biscay; Thorshavn, Faroes; p. 311: as *L. cruciata*; France. Neppi & Stiasny 1913*b*, p. 59, Pl. 3, figs. 27–9: as *L. cruciata*; Trieste; p. 60, Pl. 3, figs. 30–1: as *L. bigelowi*; Trieste. Vanhöffen 1913*a*, p. 420: *Laodice undulata*; Tortugas, Florida. Bigelow 1914*b*, p. 12: *L. calcarata*, probably = *L. cruciata*; New England, U.S.A. Bigelow 1915*b*, pp. 316, 319: as *L. cruciata*; between Cape May and Chesapeake Bay, east coast of U.S.A. Int. Plankt. Catal. III 1916: as *L. calcarata*; England. Bigelow 1917, p. 306: as *L. cruciata*; off Georges Bank, New England, U.S.A. Bigelow 1918, p. 387: as *L. cruciata*; Straits of Florida. Kramp 1919, p. 16, Pl. 2, figs. 1–8, chart II: *L. undulata*; synonyms, discussion; northern Atlantic; p. 23: *L. bigelowi* – *L. undulata*. Kramp 1920*a*, p. 4: northern Atlantic. Kramp 1920*b*, p. 10: near Rockall, Scotland. Bigelow 1922, p. 159: as *L. cruciata*; S. of Long Island, U.S.A. Lebour 1922, p. 662: as *L. cruciata*; food. Lebour 1923, p. 80, fig. 4*d*: food. Kramp 1924, p. 16: Mediterranean. Kramp & Damas 1925, p. 286: Norway. Ranson 1925*a*, p. 89: as *L. cruciata*; English Channel. Ranson 1925*c*, p. 462: St Waast, English Channel. Bigelow 1926, p. 54: as *L. cruciata*; Gulf of Maine, U.S.A. Kramp 1927, p. 103, map: Denmark. Kramp 1930, p. 19, map: English Channel; S.W. North Sea. Mar. Biol. Ass. 1931, p. 81: Plymouth. Thiel 1932*a*, p. 141. Thiel 1932*b*, pp. 442 ff.: distribution. Kramp 1933*a*, p. 554, figs. 16–18: synonyms; distribution. Ranson 1933*b*, p. 226: all Indo-Pacific forms are referred to *L. undulata*; distribution; new locality: off Portugal. Ranson 1933*e*, figs. 1–4: Mediterranean. Thiel 1935*c*, p. 166: Black Sea. Ranson 1936*b*, p. 111: near Lisbon, Portugal. Russell 1936*a*, pp. 581–7, figs. 1–7: rearing of *L. undulata* from its hydroid, a *Cuspidella*; Plymouth. Kramp 1937*b*, p. 80, figs. 4B, 32, 34A: Denmark. Russell 1938*b*, pp. 413, 416, 417, 419, 427, 436: Plymouth. Thiel 1938*c*, p. 322: *L. undulata*; discussion of *L. pulchra*; Patagonian Bank, southern Atlantic. Bigelow & Sears 1939, p. 366: as *L. cruciata*; off Chesapeake and Hog Island, east coast of U.S.A. Kramp 1939*a*, p. 10: Iceland. Russell 1939*a*, pp. 179, 188: North Sea. Russell 1940*a*, p. 519, figs. 28–31: nematocysts. Kramp 1947, p. 52: S. of Iceland. ?Uchida 1947*a*, p. 304: as *L. cruciata*; China Sea; Palao Islands, Pacific. Babnik 1948, p. 22, fig. 3: Adriatic Sea; pp. 71, 72: biological remarks. Fraser 1949*a*, p. 27: Scotland and Faroes. Fraser 1949*b*, p. 66: Shetland-Faroe Channel. Fraser & Saville 1949*a*, p. 30: Faroe Channel. Franc 1951, p. 28: St Malo, English Channel. Fraser 1952*b*, p. 104: Scottish coasts. Kramp 1953,

p. 269: all Atlantic and Mediterranean forms of *Laodicea* are probably *L. undulata*. RUSSELL 1953, p. 230, Pl. 14, figs. 1–3, text-figs. 123–31: *L. bigelowi* synonym of *L. undulata*; British coasts. SOUTHWARD 1954, p. 19: Irish Sea. FRASER 1955, p. 12: British Isles. HURE 1955, p. 6: Adriatic Sea. KRAMP 1955*a*, p. 253: Gold coast, W. Africa; p. 308: *Laodice ulothrix* Haeckel. KRAMP 1955*b*, p. 156: by Haeckel 1879 determined as *Laodice cruciata*. WIBORG 1955, p. 53: near Faroes. FRASER 1956, p. 53: as *Laodicea*; W. of Scotland. NAUMOV 1956*a*, pp. 558–61, text-fig. 1*a*: as *L. cruciata*; medusa and hydroid. VANNUCCI 1956*b*, pp. 246–9: Clyde Sea, Scotland. KRAMP 1957*a*, pp. 27, 124: S.W. of Cape of Good Hope; off Aracaju, Brazil. PETERSEN 1957, p. 35: S. of Iceland; Cape Farewell, Greenland. ?VANNUCCI 1957*d*, pp. 57, 90, 98, 101, 102, 103: Brazil; determination uncertain. KRAMP 1958*a*, pp. 120, 127: Villefranche, Mediterranean. KRAMP 1959*a*, pp. 33, 135, 211–16, 219, 220, 221, 223, 225, 227, 232, 234, 235, 237, fig. 153: Mediterranean; West Africa; West Indies (new records); diagnosis; distribution. KRAMP 1959*b*, p. 6: West Africa. WERNER 1959*a*, p. 33: Port Erin, Isle of Man.

Genus ***Melicertissa*** Haeckel 1879

Laodiceidae with eight simple, narrow radial canals.

Type-species: *M. clavigera* Haeckel.

HAECKEL 1879, p. 135: *Melicertissa* n.g. MAYER 1910, p. 209: *Melicertissa* + *Melicertidium*, in part, Haeckel 1879.

Melicertissa adriatica Neppi 1915 *

46 mm wide, flatter than a hemisphere, jelly fairly thick. Stomach short, bell-shaped, mouth with eight short, crenulated lips; gonads linear, along whole length of radial canals. Eight perradial and between them 16 tentacles, all alike; 3–5 cordyli between successive tentacles, each with a black ocellus, and even more cirri.

NEPPI 1915, p. 2: *Melicertissa adriatica* n.sp.; Adriatic Sea. GROBBEN 1915, p. 2: *M. adriatica*; Adriatic Sea (report of Neppi 1915). KRAMP 1959*a*, pp. 139, 223: diagnosis; distribution.

Melicertissa clavigera Haeckel 1879

10 mm wide, flatter than a hemisphere, moderately thin. Stomach flat, eight short lips; gonads somewhat sinuous, upon middle halves of canals. Eight tentacles; 24 cordyli; 32 ocelli; no cirri.

HAECKEL 1879, p. 135, Pl. 8, figs. 8–12: *Melicertissa clavigera* n.g., n.sp.; Canary Islands, Atlantic Ocean. MAYER 1910, p. 210, text-fig. 106: *M. clavigera*, in part. NAIR 1951, p. 59: Trivandrum coast, India. KRAMP 1955*a*, p. 308. KRAMP 1959*a*, pp. 139, 224, 272, fig. 161: diagnosis; distribution.

Melicertissa malayica (Maas 1905)

32 mm wide. Stomach flat, eight simple lips. Gonads linear, upon proximal 1/3 of length of radial canals. About 160 tentacles, every fourth with an abaxial (?) ocellus; cordyli irregularly scattered; a few coiled cirri.

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* See Addenda, p. 444.

MAAS 1905, p. 28, Pl. 5, figs. 29–31: as *Melicertidium malayicum* n.sp.; Malay Archipelago. MAYER 1910, p. 211, fig. 107: *Melicertissa malayica.*

Melicertissa mayeri Kramp 1959

7 mm wide. Resembles *M. clavigera*, but with 16 tentacles and 16 cordyli.

MAYER 1910, p. 210, Pl. 24, figs. 2, 3: as *Melicertissa clavigera*; Florida. NAIR 1951, p. 59: Mayer's specimens from Florida are considered different from Haeckel's (from the Canary Islands). KRAMP 1959*a*, pp. 139, 231, fig. 162: *M. mayeri* n.sp.; diagnosis; distribution.

Melicertissa platygastra Nair 1951

7 mm wide, almost watch-glass-shaped, very thick in the centre, thin towards periphery. Stomach flat, wide; mouth with eight lanceolate lips; gonads in middle of radial canals. Eight short, stumpy tentacles with large, conical bulbs. In each octant 4–6 sense-clubs, and 12–14 dark ocelli.

NAIR 1951, p. 60, Pl. 1, figs. 16, 17: *Melicertissa platygaster* n.sp.; Trivandrum coast, India.

Genus ***Orchistoma*** Haeckel 1879

Laodiceidae with more than eight simple radial canals, which arise separately from periphery of the stomach. The whole dorsal wall of the stomach attached to subumbrella; with ocelli; with a gastric peduncle. Systematic position uncertain.

Type-species: *O. pileus* (Lesson).

HAECKEL 1879, p. 138: *Orchistoma* n.g., belonging to family Thaumantiadae. MAYER 1910, p. 211: belongs to family Thaumantiadae, subfamily Melicertinae. KRAMP 1959*c*, p. 240: discussion.

Orchistoma agariciforme Keller 1884

Similar to *Orchistoma pileus*, except seven lips instead of 32. 19 or more radial canals.

KELLER 1884, p. 418, Pl. 21, figs. 1–3: *Orchistoma agariciforme* n.sp.; Naples, Italy. MAYER 1910, p. 212. KRAMP 1959*a*, pp. 140, 223: diagnosis; distribution.

Orchistoma pileus (Lesson 1843)

30–40 mm wide, flat-topped with vertical sides; apical jelly very thick. Manubrium with wide, large peduncle; stomach wide and shallow, 32 long, complexly crenulated lips. 32 radial canals; 32 short, swollen gonads on radial canals near stomach. 64 short tentacles with well developed bulbs; about 100 slender cordyli with nematocysts; about 400 adaxial ocelli.

LESSON 1843, p. 317, Pl. 6, fig. 1: as *Mesonema pileus* n.sp.; W. Africa? HAECKEL 1879, p. 139, Pl. 15, figs. 3–5: as *Orchistoma* n.g. *steenstrupii*; West Indies. MAYER 1910, p. 211, Pl. 25, figs. 1–4: *Orchistoma pileus*; Florida; Bahamas. KRAMP 1955*b*,

p. 157: by Haeckel 1879 determined as *O. steenstrupii.* KRAMP 1959*a*, pp. 34, 139, 232, fig. 163: West Indies (new record); diagnosis; distribution. KRAMP 1959*c*, p. 240: provisionally retained in the family Laodiceidae.

Genus ***Ptychogena*** A. Agassiz 1865

Laodiceidae with four radial canals giving rise to lateral diverticula, in which the gonads are placed; stomach with funnel-shaped perradial lobes; without cirri; without ocelli.

Type-species: *P. lactea* A. Agassiz.

A. AGASSIZ 1865, p. 137: *Ptychogena* n.g., belongs to family Melicertidae. BROWNE 1907, p. 473: *Ptychogena* belongs to family Laodiceidae. MAYER 1910, p. 214: belongs to subfamily Melicertinae, family Thaumantiadae. BIGELOW 1913, p. 28: discussion of species. KRAMP & DAMAS, p. 292: discussion of species.

Ptychogena antarctica Browne 1907

60–100 mm wide, slightly convex, jelly very thick. Stomach wide, with funnel-shaped perradial lobes almost to terminal portions of the gonads; gonads on nearly whole length of radial canals, in 10–15 lateral folds on either side, each of them further divided into 2–5 lamellar folds, not attached to subumbrella. About 300 tentacles and as many cordyli with few nematocysts.

BROWNE 1907, p. 474: *Ptychogena antarctica* n.sp.; provisional description; Antarctic. BROWNE 1910, p. 29, Pl. 2, figs. 6–9: Cape Adare; McMurdo Sound, Antarctic. MAYER 1910, p. 217: ?*P. antarctica.* VANHÖFFEN 1912, p. 365: Antarctic, Gauss station. THIEL 1932*b*, p. 477. KRAMP 1957*a*, pp. 28, 124, Pl. 4, fig. 8: a valid species; S. Orkney Islands. KRAMP 1959*a*, pp. 137, 235, 264. 269: diagnosis; distribution.

Ptychogena aurea Vanhöffen 1912

8–12 mm high, 10–12·5 mm wide. Stomach short, wide, open; folded gonads along greater part of radial canals. About 32 tentacles, cordyli not observed. Colour yellow and orange. Probably = *Chromatonema rubrum.*

VANHÖFFEN 1912, p. 366, Pl. 24, fig. 4: *Ptychogena aurea* n.sp.; Gauss Station, Antarctic. KRAMP & DAMAS 1925, p. 293: doubtful species. KRAMP 1957*a*, p. 27: probably = *Chromatonema rubrum.*

Ptychogena californica Torrey 1909

10 mm wide, more than half as high as broad. Manubrium shallow, broad; mouth large without lobes. Gonads with 12–14 folds in proximal half of radial canals. About 48 tentacles; 1–5 cordyli between tentacles.

TORREY 1909, p. 13, figs. 1–2: *Ptychogena californica* n.sp.; San Diego, California. MAYER 1910, p. 494. FOERSTER 1923, p. 249. THIEL 1932*b*, p. 478.

Ptychogena crocea Kramp & Damas 1925

25 mm wide and high, fairly thick walls. Manubrium large, cruciform,

mouth rim slightly folded, four short lips; the proximal half to 2/3 of the length of the radial canals is high and laterally compressed with gonads in 6–7 lateral, free lamellae on each side. About 64 tentacles, 2–4 cordyli between tentacles, with distal nematocysts. Colour saffron.

KRAMP & DAMAS 1925, p. 290, Pl. 1, figs. 1–7: *Ptychogena crocea* n.sp.; Norway. THIEL 1932*b*, p. 478. KRAMP 1933*a*, p. 558, fig. 21. KRAMP 1937*b*, p. 83, fig. 33. RUSSELL 1940*a*, p. 519, figs. 18, 19: nematocysts. KRAMP 1947, p. 52: Mangerfjord, Bergen. REES 1953*a*, p. 8: Herdlafjord, Norway. KRAMP 1959*a*, pp. 137, 238, 240, fig. 158: diagnosis; distribution.

Ptychogena hyperborea Kramp 1942

15 mm wide, 8 mm high, very thick. Stomach broad, quadrangular, mouth somewhat folded; stomach with four large, perradial lobes. Gonads in 2–3 pairs of lateral folds on proximal half of radial canals above lobes of stomach. About 80 tentacles, probably as many cordyli. Stomach with a deep reddish-brown colour.

KRAMP 1942, p. 55, fig. 18: *Ptychogena hyperborea* n.sp.; Smith Sound, W. Greenland. KRAMP 1959*a*, pp. 138, 238, 240, fig. 159: diagnosis; distribution.

Ptychogena lactea A. Agassiz 1865

Up to 90 mm wide, 30 mm high, very thick. Stomach short, quadratic, mouth rim slightly crenulated, four short lips; radial canals with 20–30 lamelliform lateral diverticula on either side, in their entire length attached to subumbrella. 300–500 tentacles and as many club-shaped cordyli without nematocysts.

A. AGASSIZ 1865, p. 137, figs. 220–4: *Ptychogena lactea* n.g., n.sp.; Massachusetts Bay. HAECKEL 1879, p. 148: as *P. pinnulata* n.sp.; between Ireland and Iceland. MAYER 1910, p. 215, fig. 109: *P. lactea* = *P. pinnulata* Hckl. (N.E. America; W. Greenland; Barents Sea). BIGELOW 1913, p. 28: Bering Sea; Kamchatka; E. of Kurile Islands; Sea of Okhotsk; S.E. coast of Hokkaido, Japan. KRAMP 1913*a*, p. 268: W. Greenland. BIGELOW 1914*b*, p. 13: Nahant, Massachusetts. KRAMP 1914, p. 422: W. Greenland. KRAMP 1919, p. 31, Pl. 3, figs. 1–6, text-fig. 5: northern Atlantic. FOERSTER 1923, p. 249. BIGELOW 1926, pp. 59, 348: Gulf of Maine, U.S.A. THIEL 1932*a*, p. 142. THIEL 1932*b*, pp. 442 ff.: distribution. KRAMP 1933*a*, p. 557, figs. 19, 20: distribution and synonyms. BIGELOW & SEARS 1939, p. 249. YASHNOV 1939, p. 112: Kara Sea; Laptev Sea. KRAMP 1942, p. 52, fig. 17: W. Greenland. YASHNOV 1948, p. 71, Pl. 20, fig. 1: Barents Sea; Kara Sea; Laptev Sea; Bering Sea; Sea of Okhotsk. CHIU 1954*b*, p. 56. KRAMP 1955*b*, p. 157: by Haeckel 1879 determined *P. pinnulata*. NAUMOV 1956*b*, p. 37. KRAMP 1959*a*, pp. 137, 208, 210, 211, 212, 264, 269, fig. 157: diagnosis; distribution.

Ptychogena longigona Maas 1893

25 mm wide, flat. Stomach shallow, quadrangular, mouth wide. Gonads on entire length of radial canals in short, sac-like elevations or papillae. About 100 tentacles and a row of marginal clubs. (Doubtful species.)

MAAS 1893, pp. 64, 97, Pl. 6, figs. 7–9: *Ptychogena longigona* n.sp.; northern Atlantic. MAYER 1910, p. 217, fig. 110. KRAMP 1919, p. 35: doubtful species, possibly – *Laodicea undulata*.

Genus ***Staurodiscus*** Haeckel 1879

Laodiceidae with four radial canals, each giving rise to one or more pairs of lateral branches which may or may not communicate with the ring canal; primary radial canals proceeding straight to the ring canal. Gonads on main canals and branches. With adaxial ocelli; without marginal cirri. (New definition).

Type-species: *S. tetrastaurus* Haeckel.

HAECKEL 1879, p. 145: *Staurodiscus* n.g., family Cannotidae. BROWNE 1907, p. 475: belongs to Laodiceidae. MAYER 1910, p. 213: belongs to subfamily Polyorchinae, family Thaumantiadae. UCHIDA 1927*c*, p. 165: *Staurodiscoides* n.g.

Staurodiscus brooksi (Mayer 1910)

Size unknown. Flatter than a hemisphere, evenly rounded. Manubrium short, small, eight-sided with four long and four short lips. Eight radial canals, four of them with two lateral branches; gonads extending outwards from the stomach. 16 tentacles. No ocelli observed.

MAYER 1910, p. 227, fig. 118*a*, *b*: as *Dipleurosoma brooksi* n.sp.; described from a drawing by Brooks; Bahama Islands. KRAMP 1959*a*, pp. 141, 231, fig. 168*a*: as *Toxorchis brooksi*; diagnosis; distribution.

Staurodiscus gotoi (Uchida 1927)

25 mm wide, 20 mm high, summit thick. Manubrium short, four-sided, with folded lips; radial canals each with 3–4 pairs of lateral branches, not opposite each other, the proximal longer than the distal, canals and branches with secondary diverticula. In the only specimen observed the branches do not quite reach to the ring canal. Gonads along canals and branches. 4 long and 4 smaller tentacles; 88 cordyli. Adaxial ocelli on base of cordyli.

UCHIDA 1927*c*, p. 165, figs. 1, 2: as *Staurodiscoides gotoi* n.g., n.sp.; Shimizu Bay, Japan.

Staurodiscus heterosceles Haeckel 1879

6–8 mm wide. Radial canals with two lateral branches not opposite to each other: 12 club-shaped gonads on main canals and branches. 8–32, usually 16 tentacles, 40–80 cordyli. Probably = *S. tetrastaurus*.

HAECKEL 1879, p. 146: *Staurodiscus heterosceles* n.sp.; Canary Islands. MAYER 1910, p. 214. KRAMP 1955*a*, p. 308: *S. heterosceles* = *S. tetrastaurus*. KRAMP 1959*a*, p. 140: diagnosis; probably = *S. tetrastaurus*.

Staurodiscus nigricans Ag. & Mayer 1899

14 mm wide, dome-shaped, thin and flexible. Manubrium very short,

mouth wide; from each of the radial canals two opposed lateral branches reaching ring canal. Gonads on the 12 terminal canals. 12 short tentacles; 7 × 12 cordyli.

Agassiz & Mayer 1899, p. 164, Pl. 4, figs. 11, 12: *Staurodiscus nigricans* n.sp.; Fiji Islands. Mayer 1910, p. 221, fig. 113: as synonym of *Cannota dodecantha* Hckl. Kramp 1955*a*, p. 307: *S. nigricans* probably not =*Cannota dodecantha.*

Staurodiscus tetrastaurus Haeckel 1879

Up to 6 mm wide, half as high; stomach small, cruciform, mouth with four prominent lips. Radial canals each with two opposite blind lateral branches; gonads on side branches and distal parts of radial canals. 8–16 long tentacles; up to 48 cordyli with nematocysts; 32 ocelli.

Haeckel 1879, p. 145, Pl. 9, figs. 1–3: *Staurodiscus tetrastaurus* n.sp.; Canary Islands. Mayer 1910, p. 214, Pl. 22, figs. 7, 8, Pl. 25, fig. 5, Pl. 26, figs. 10, 11: Tortugas, Florida. Uchida 1927*c*, p. 167. Menon 1932, p. 14, Pl. 2, figs. 14, 19: Madras, India. Nair 1951, p. 60: Trivandrum coast, India. Ganapati & Nagabhushanam 1958, pp. 92, 94: Vizagapatam coast, India. Kramp 1959*a*, pp. 140, 224, 231, 265, 270, fig. 165: diagnosis; distribution.

Genus ***Staurophora*** Brandt 1838

Laodiceidae with four radial canals which in the greater part of their length are open grooves forming a large, cruciform mouth. Gonads in branched diverticula from the walls of the mouth. Adaxial ocelli; no cirri.

Type-species: *S. mertensi* Brandt.

Brandt 1838*a*, p. 399: *Staurophora* n.g. Haeckel 1879, p. 130: *Staurostoma* n.g.; p. 148: *Staurophora.* Browne 1907, p. 469: *Staurophora* = *Staurostoma.* Mayer 1910, p. 291.

Staurophora mertensi Brandt 1838

100–200 mm wide, flatter than a hemisphere; up to 4,400 short tentacles, all with adaxial ocellus, alternating with club-shaped cordyli without nematocysts.

Brandt 1838*a*, p. 400, Pl. 24, 25: *Staurophora mertensii* n.g., n.sp.; N. Pacific. Kishinouye 1910, p. 29: *S. discoides*; Japan; Saghalin. Mayer 1910, p. 291, Pl. 26, figs. 4–9: *S. mertensii* = *S. laciniata* L. Agassiz, *S. arctica* Hckl.; N. New England; (N. Pacific; W. Greenland; N.W. Europe; N. Russia); p. 293: *S. falklandica* Browne 1908 =? *S. mertensii*; p. 725: *S. discoidea* Kishinouye = *S. mertensii.* Bigelow 1913, p. 27: no difference between Pacific and Atlantic specimens; Dutch Harbour; Prince William's Sound, Alaska. Kramp 1913*a*, p. 269: as *S. arctica*; W. Greenland. Bigelow 1914*a*, p. 123: Gulf of Maine, U.S.A. Bigelow 1914*b*, p. 12: New England, U.S.A. Bigelow 1914*d*, p. 407: Massachusetts Bay, U.S.A. Kramp 1914, p. 420: W. Greenland. Bigelow 1915*b*, pp. 273, 316, 319, 320: Gulf of Maine, U.S.A. Bigelow 1917, pp. 303, 305: Gulf of Maine, U.S.A. Kramp 1919, p. 39, Pl. 1, fig. 9, Pl. 2, figs. 9–10, Pl. 3, fig. 7, chart IV: *S. mertensii* = *S. falklandica* Browne 1908, *S. discoidea* Kishin. 1910; N. Atlantic; p. 41: *Staurophora laciniata*, Vanhöffen 1911*a*, p. 219 and 1912, p. 366, and *S. antarctica* Vanhöffen 1912, p. 367

are young Pandeidae. Willey & Huntsman 1921, p. 2: Passamaquoddy Bay between Gulf of Maine and Fundy Bay, U.S.A. Bigelow 1922, p. 134: coastal water of N.E. United States. Foerster 1923, p. 249. Kramp & Damas 1925, p. 288: Norway. Uchida 1925*b*, p. 93: Saghalin. Bigelow 1926, pp. 38, 43, 342: Gulf of Maine, U.S.A. Fish 1926, p. 125: as *Staurostoma laciniata*; Woods Hole, U.S.A. Kramp 1927, p. 105: Denmark. Thiel 1932*a*, p. 142. Thiel 1932*b*, pp. 442 ff.: distribution. Kramp 1933*a*, p. 559, figs. 22, 23: distribution and synonyms. Frost 1937, p. 26: Newfoundland. Kramp 1937*b*, p. 84, figs. 34*b*, 35: Denmark. Kramp 1939*a*, p. 11: Iceland. Russell 1940*a*, p. 519, figs. 20, 21: nematocysts. Uchida 1940*a*, p. 290, fig. 6: Japan. Kramp 1942, p. 56: W. Greenland. Kramp 1947, p. 52: N. of Iceland. Yashnov 1948, p. 71, Pl. 20, fig. 2*a*–*b*: Barents Sea; White Sea; Bering Sea; Sea of Okhotsk. Fraser 1949*a*, p. 27: Scotland—Faroes. Fraser 1949*b*, p. 66: northern North Sea. Fraser 1950, p. 94: northern North Sea. Naumov 1951*b*, p. 748, fig.: rearing of the hydroid, *Cuspidella ?grandis* or *C. humilis*; north of Russia. Gauld 1952, p. 752: Firth of Clyde. Künne 1952, pp. 5, 10, 32: S.E. North Sea. Russell 1953, p. 239, figs. 132–7: Scotland and northern England, probably the only species. Chiu 1954*b*, p. 56. Kramp 1955*b*, p. 156: by Haeckel determined *Staurostoma laciniata*. Naumov 1956*a*, pp. 558–61, fig. 1*b*: development; medusa and hydroid. Naumov 1956*b*, p. 37. Vannucci 1956*b*, pp. 244, 246, 249: Clyde Sea, Scotland. Kramp 1957*a*, pp. 29, 96, 105, 124: variation; *S. falklandica* Browne = *S. mertensi*; Falkland Islands; South Orkney Islands. Petersen 1957, p. 36: south of Iceland. Kramp 1959*a*, pp. 138, 208, 210, 211, 215, 216, 218, 219, 221, 235, 237, 238, 264, 269, fig. 160: diagnosis; distribution.

Staurophora purpurea Foerster 1923

20 mm wide, 10 mm high, thick. Mouth a large, long slit with curtain-like margins; no lateral diverticula. About 150 large tentacle knobs; no ocelli seen. About 100 lithocysts. Systematic position doubtful.

Foerster 1923, p. 250, Pl. 4, figs. 2–5: *Staurophora purpurea* n.sp.; Vancouver.

Genus ***Toxorchis*** Haeckel 1879

Laodiceidae with four, six or more main radial canals, some or all branching dichotomously one or more times, all branches reaching ring canal; primary radial canals not proceeding to ring canal. Gonads upon outermost branches; numerous tentacles and cordyli, cirri may be present. (New definition.)

Type-species: *T. arcuatus* Haeckel.

Haeckel 1879, p. 156: *Toxorchis* n.g.; p. 160: *Cladocanna* n.g.; belongs to subfamily Williadae, family Cannotidae. Browne 1907, p. 476: belongs to family Laodiceidae. Mayer 1910, p. 228: belongs to subfamily Berenicinae, family Thaumantiadae.

Toxorchis arcuatus Haeckel 1879

6 mm wide, flat to hemispherical. Stomach small and flat, mouth with six crinkled, lanceolate lips. Six wide main radial canals which fork at their middle points. Gonads upon the forked ends of the radial canals. 24 long tentacles, each with an ocellus. Numerous cordyli and cirri.

Haeckel 1879, p. 157, Pl. 9, figs. 6–8: *Toxorchis arcuatus* n.g., n.sp.; Canary Islands. Mayer 1910, p. 228, fig. 119. Kramp 1955*a*, p. 308. Kramp 1959*a*, pp. 141, 224, 226, fig. 166: diagnosis; distribution.

Toxorchis kellneri Mayer 1910

15 mm wide, moderately thin, almost hemispherical. Manubrium shallow; eight lanceolate, folded lips; eight wide radial canals, most of them bifurcated near stomach; gonads extending outwards from bifurcation. About 32 tentacles and about 50 cordyli, with ocelli at base of each tentacle and cordylus; no cirri.

Mayer 1910, p. 229, Pl. 28, figs. 1, 2: *Toxorchis kellneri* n.sp.; Tortugas, Florida. Vanhöffen 1913*a*, p. 421: Tortugas, Florida. Bigelow 1917, p. 306: off Georges Bank, east coast of U.S.A. Bigelow 1926, p. 54: Gulf of Maine, U.S.A. Kramp 1959*a*, pp. 141, 211, 212, 231, 233, fig. 167: diagnosis; distribution.

Toxorchis polynema Kramp 1959

17 mm wide, flat. Stomach broad and flat, mouth with broad and crenulated lips; four groups of radial canals, each bifurcating twice inside the cruciform base of the stomach, 16 (4×4) canals leaving the stomach, all running to the ring canal; gonads along proximal 3/4 to 2/3 of the length of the radial canals. About 300 tentacles and as many cordyli.

Kramp 1959*a*, pp. 34, 141, Pl. 1, fig. 13, Pl. 2, fig. 4: *Toxorchis polynema* n.sp.; Angola, W. Africa. Kramp 1959*c*, p. 242: Nicobar Islands.

Toxorchis thalassinus (Péron. & Lesueur 1809)

About 50 mm wide. Stomach shallow, with six wide lips. Six wide radial canals, branching dichotomously 3–4 times, about 100 branches reaching circular canal; sac-like, folded gonads on outermost branches. 100 or more long tentacles with cordyli and cirri between them.

Péron & Lesueur 1809, p. 327: as *Berenix thalassina* n.sp.; New Guinea; North Australia. Mayer 1910, p. 228: *Toxorchis thalassina.* Kramp 1953, p. 306: discussion.

Family *MITROCOMIDAE*

Leptomedusae with open marginal vesicles; with four, eight or more simple radial canals; with gonads on radial canals separated from stomach; with hollow marginal tentacles; with or without marginal cirri; with or without ocelli. Hydroids, where known, *Cuspidella*-like.

Kramp 1932, pp. 305–84: monograph.

Genus ***Cosmetira*** Forbes 1848

Mitrocomidae with four radial canals; with eight lithocysts without ocelli;

with flexile cirri provided with nematocysts throughout their length; usually straight, exceptionally, in young specimens, spirally coiled.

Type-species: *C. pilosella* Forbes.

Forbes 1848, p. 42: *Cosmetira*, a subgenus of *Thaumantias*. Browne 1910, p. 32: *Cosmetira*, a proper genus.

Cosmetira pilosella Forbes 1848

20–48 mm wide, usually hemispherical. Stomach small; four pointed, somewhat folded lips; gonads linear, narrow, slightly sinuous, along middle 1/2–2/3 of radial canals. 64–100 tentacles. 6–10 cirri between successive tentacles, older cirri extending well up surface of umbrella; eight lithocysts, each with 12 or more concretions.

Forbes 1848, p. 42, Pl. 8, fig. 1: as *Thaumantias* (*Cosmetira*) *pilosella* n.sp.; Shetland Islands; English Channel. Maas 1893, p. 57, Pl. 6, figs. 3–6: as *Halopsis megalotis* n.sp.; N.W. coast of Scotland. Browne 1910, pp. 32, 33: *Cosmetira pilosella* and *megalotis*. Mayer 1910, p. 261: *C. pilosella* (N.W. Europe); p. 289: as *Mitrocoma megalota* (North Atlantic). Le Danois 1913*b*, p. 21, fig. 7: as *Laodice cruciata*; Little Minch, Scotland. Le Danois 1913*d*, p. 311: as *L. cruciata*; off Douarnenez and Banc de la Chapelle, France. Int. Plankt. Catal. III 1916, p. 43: as *Eucheilota pilosella;* England. Lebour 1916*a*, p. 51: Plymouth. Lebour 1916*b*, pp. 57–9: Plymouth. Lebour 1917, p. 161: Plymouth. Kramp 1919, p. 61: *C. pilosella*; p. 64: as *C. megalotis*; E. coast of Scotland. Lebour 1922, p. 664: food. Lebour 1923, p. 78, fig. 4*a*, *b*: food. Peacock 1923, p. 95: Cullercoats, England. Coy 1924, p. 56: Cullercoats, England. Peacock 1924, p. 59: Cullercoats, England. Kramp & Damas 1925, p. 298: Bergen, Norway. Russell 1925, p. 784: Plymouth. Russell 1926, p. 434: Plymouth. Kramp 1927, p. 110, map: Denmark. Russell 1927, p. 572: Plymouth. Russell 1928, p. 86: Plymouth. Kramp 1930, p. 25: English Channel. Sanderson 1930, p. 227: Northumberland coast, England. Watson 1930, p. 236: Northumberland coast, England. Mar. Biol. Ass. 1931, p. 82: Plymouth. Russell 1931*b*, p. 771, Pl. 1: Plymouth. Kramp 1932, p. 356, figs. 7, 8, 10, 13, 16, 17, 25–7, 44: *C. pilosella*; description, synonyms and distribution; p. 358, fig. 45: as *C. megalotis*; description, synonyms and distribution; new locality: Scilly Islands, Channel. Kramp 1933*a*, p. 569, fig. 33: *C. pilosella*; p. 570, fig. 34: as *C. megalotis*; synonyms and distribution. Russell 1933, tab. I: Plymouth. Wulff, Bückmann & Künne 1934, p. 334: as *C. megalotis*; North Sea. Russell 1935*b*, pp. 311, 314, 318: English Channel. Kramp 1937*b*, p. 93, fig. 40: Denmark. Künne 1937*a*, pp. 138, 151, 153, 155, 157, 159, 161: as *C. megalotis*; North Sea. Moore 1937, p. 49: Port Erin, Isle of Man. Russell 1938*b*, pp. 413, 416, 417, 419, 428, 436: *C. pilosella* probably =*C. megalotis*; Plymouth. Russell 1939*a*, pp. 177, 179, 188: North Sea. Rees 1941*c*, pp. 55–8: description of the hydroid; Clyde, Scotland. Fraser 1949*a*, p. 27: northern North Sea. Fraser 1949*b*, p. 66: from Shetland Islands to Faroes. Fraser & Saville 1949*a*, p. 30: Faroe Channel. Fraser 1952*b*, p. 104: *Cosmetira*; northern North Sea. Russell 1953, p. 266, Pl. 15, figs. 1–3, text-figs. 156–61: British coasts; p. 273: =*C. megalotis.* Southward 1954, p. 19: Irish Sea. Fraser 1955, p. 12: as *Cosmetira* sp.; British Isles. Wiborg 1955, p. 53: near Shetland Islands. Fraser 1956, p. 53: as *Cosmetira*; W. of Scotland. Vannucci 1956*b*, pp. 244, 245, 249: Clyde Sea, Scotland. Alvariño 1957*b*, p. 26: Portugal. Kramp 1959*a*, pp. 144, 215, 216, 219, 222, 223, fig. 175: diagnosis; distribution.

Genus ***Cosmetirella*** Browne 1910

Mitrocomidae with four radial canals; with eight lithocysts without ocelli; without marginal cirri.

Type-species: *C. davisi* (Browne).

Cosmetirella davisi (Browne 1902)

Up to 60 mm wide, larger in subantarctic than in antarctic waters; almost hemispherical. Stomach small; lips somewhat folded; gonads linear, sinuous, along 1/2 – 2/3 of radial canals. Number of tentacles very variable, up to 180; normally eight lithocysts with several concretions.

Browne 1902, p. 281: as *Tiaropsis davisii* n.sp.; Falkland Islands. Browne 1910, p. 34, Pl. 1, figs. 6–8: as *Cosmetirella simplex* n.g., n.sp. Mayer 1910, p. 259: as *Tiaropsis davisii*. Vanhöffen 1911*a*, p. 223, Pl. 22, fig. 10: as *Phialella falklandica*; Kerguelen Island. Vanhöffen 1912, p. 368: as *C. kerguelensis* and *C. simplex*; Antarctic. Vanhöffen 1920, p. 16: as *C. simplex*; off South-West Africa. Kramp 1932, p. 359, figs. 4, 34, 46: *C. davisi* = *Tiaropsis davisii* Browne, *C. simplex* Browne, *C. kerguelensis* Vanhöffen and *Phialella falklandica* Vanhöffen; description and distribution. Thiel 1938*c*, p. 327: South Georgia. Browne & Kramp 1939, p. 293, Pl. 17, fig. 1: Falkland Islands. Kramp 1949*a*, p. 3: map of distribution; South Georgia. Kramp 1957*a*, pp. 31, 96, 97, 105, 110 ff., 124, text-fig. 6, map: variation; S. Georgia; S. of Cape of Good Hope; Graham Land and Knox Land, Antarctic; S. Patagonia. Kramp 1957*b*, pp. 157, 162: Kerguelen Islands. Kramp 1957*c*, p. 2: Heard Island, Antarctic. Kramp 1959*a*, pp. 144, 227, 230, 235, 237, 267, 269, fig. 176: diagnosis; distribution.

Genus ***Cyclocanna*** Bigelow 1918

Mitrocomidae with four radial canals each bent like an S; with eight lithocysts without ocelli; with two kinds of tentacles; without marginal cirri.

Type-species: *C. welshi* Bigelow.

Cyclocanna welshi Bigelow 1918

Diameter 44–68 mm; watch-glass-shaped. Manubrium quadrangular, about as long as broad with four short lips; radial canals in their distal part following the ring canal, which they join in the next perradius. Four long and about 80 rudimentary tentacles. Hydroid unknown.

Bigelow 1918, p. 383, Pl. 3, figs. 2–5: *Cyclocanna welshi* n.g., n.sp.; systematic position uncertain; western Atlantic. Kramp 1926*b*, p. 245, fig. 1: Skagerak. Kramp 1927, p. 103: Skagerak. Kramp 1933*a*, p. 571, fig. 35: *C. welshi* belongs to

Mitrocomidae; new locality near Bergen, Norway. Kramp 1937*b*, p. 94, fig. 41: Denmark. Kramp 1947, p. 52: Mangerfjord, Bergen. Kramp 1959*a*, pp. 144, 238, 240, fig. 177: diagnosis; distribution.

Genus ***Halistaura*** Bigelow 1913

Mitrocomidae with four radial canals; with numerous lithocysts without ocelli; without marginal cirri.

Type-species: *H. cellularia* (Agassiz).

Halistaura cellularia (Agassiz 1865)

Diameter 50–90 mm; umbrella almost hemispherical, thick. Stomach very small, with four long, slender, crenulated lips; gonads narrow, along nearly whole length of radial canals. 250–340 tentacles, with swollen cylindrical bulbs; 16–24 lithocysts, number of concretions unknown.

Agassiz 1865, p. 127, figs. 195, 196: as *Laodicea cellularia* n.sp.; Gulf of Georgia. Mayer 1910, p. 199: as *Thaumantias cellularia.* Bigelow 1913, p. 30: *Halistaura cellularia* n.g.; southern Alaska. Foerster 1923, p. 36. Kramp 1932, p. 362, fig. 47: description; synonyms and distribution. Thiel 1935*c*, p. 165: *Eugenia cimmeria* Iljin probably belongs to Mitrocomidae and possibly = *H. cellularia*; Black Sea. Hyman 1940, p. 282: physiology; Puget Sound. Mac Ginitie 1955, pp. 95, 119: Point Barrow, Alaska.

Genus ***Halopsis*** A. Agassiz 1863

Mitrocomidae with more than eight radial canals; with numerous lithocysts without ocelli; with marginal cirri which coil spirally.

Type-species: *H. ocellata* A. Agassiz.

Halopsis ocellata A. Agassiz 1863

Diameter 50–65 mm; umbrella about four times as broad as high. Stomach broad and flat, mouth with four fairly short lips. Radial canals 12–16, in four groups. Gonads linear, sinuous bands along 2/3 of the length of the radial canals. About 450 tentacles, 1/3 as long as the diameter of bell, with broad, conical bulbs; one cirrus between tentacles; about 80 lithocysts with many concretions.

A. Agassiz 1863, p. 219: *Halopsis ocellata* n.g., n.sp.; Gulf of Maine, U.S.A. Mayer 1910, p. 323, figs. 183, 184. Le Danois 1913*b*, p. 24, fig. 10: as *Stomobrachium tentaculatum*; S.W. of Ireland. Le Danois 1913*c*, p. 352: as *S. tentaculatum.* Bigelow 1914*a*, p. 102: Gulf of Maine, U.S.A. Bigelow 1914*b*, p. 13: N. of Cape Cod, New England. Kramp 1919, p. 65, Pl. 4, figs. 1–5, text-figs. 6–9: N.E. Atlantic. Kramp 1920*a*, p. 10, figs. 1–6: northern Atlantic. Kramp & Damas 1925, p. 299, fig. 26: west coast of Norway. Kramp 1932, p. 353, figs. 6, 12, 19, 28, 32, 43: description; synonyms and distribution. Runnström 1932, p. 29: Herdlafjord, Norway. Thiel 1932*a*, p. 144: as *H. ocellata*; p. 148: as *S. tentaculatum.*

Thiel 1932*b*, pp. 443 ff.: as *H. ocellata*; pp. 444 ff.: as *S. tentaculatum*. Kramp 1933*a*, p. 567, figs. 31, 32: distribution. Kramp 1937*b*, p. 92, fig. 39: Denmark. Jensen 1939, p. 23: W. Greenland. Kramp 1939*a*, p. 13: Iceland. Russell 1939*a*, p. 177: North Sea. Kramp 1942, p. 62: W. Greenland. Fraser 1949*a*, p. 27: Scotland—Faroes. Fraser & Saville 1949*a*, p. 30: Faroe Channel. Fraser & Saville 1949*b*, p. 63: N. of Scotland. Yashnov 1948, p. 72, Pl. 20, fig. 5*a–b*: Barents Sea. Fraser 1950, pp. 94, 95: northern North Sea. Russell 1953, p. 273, Pl. 14, fig. 4, text-figs. 162–6; British coasts. Fraser 1955, p. 12: British Isles. Kramp 1957*a*, pp. 30, 96, 124; W. of Falkland Islands. Petersen 1957, p. 36: from Faroes to east coast of Greenland; northern Atlantic Ocean. Kramp 1959*a*, pp. 143, 208, 210, 211, 215, 216, 218, 235, 238, 264, fig. 174: diagnosis; distribution.

Genus ***Mitrocoma*** Haeckel 1864

Mitrocomidae with four radial canals; with numerous lithocysts without ocelli; with marginal cirri which coil spirally.

Type-species: *M. annae* Haeckel.

Haeckel 1864, p. 332: *Mitrocoma* n.g. Mayer 1910, p. 286.

Mitrocoma annae Haeckel 1864

Diameter 30–40 mm; umbrella flatter than a hemisphere, jelly thick. Stomach very small, 1/10 – 1/8 of the diameter of bell; gonads linear, sinuous, along distal 1/2 – 3/4 of radial canals. Tentacles 60–100, long with conical bulbs; 3–8 cirri between every two tentacles; 60–100 lithocysts with about 20 concretions in two rows.

Haeckel 1864, p. 327: *Mitrocoma annae* n.g., n.sp.; Mediterranean. Mayer 1910, p. 287, fig. 152. Vanhöffen 1913*b*, p. 21: Gibraltar. Neppi 1919, p. 120, fig. 2: abnormal specimen; Naples. Neppi 1920*b*, p. 89, figs. 1–3: abnormal specimen; Naples. Caziot 1921, p. 114: Villefranche-sur-Mer, Mediterranean. Kramp 1932, p. 350, figs. 21, 31, 42: description; synonyms and distribution. Babnik 1948, Tab. 4: Mediterranean. Rossi 1949, p. 26: Golfo di Rapallo. Naumov 1956*a*, pp. 558–61, text-fig. 1*g*: development; medusa and hydroid. Kramp 1958*a*, p. 121: Villefranche, Mediterranean. Kramp 1959*a*, pp. 143, 223, 276, fig. 173: diagnosis; distribution.

Mitrocoma discoidea Torrey 1909

Diameter 45 mm; umbrella flatter than a hemisphere, jelly moderately thick. Stomach short and narrow, mouth with four long and pointed lips; gonads narrow, along almost whole length of radial canals. Tentacles 180–240, short, with conical bulbs; one cirrus between every two tentacles; 20–60 lithocysts with numerous concretions.

Torrey 1909, p. 17, fig. 4: *Mitrocoma discoidea* n.sp.; coast of California. Mayer 1910, p. 289. Foerster 1923, p. 35: Vancouver. Kramp 1932, p. 349, figs. 22, 33, 41.

Mitrocoma minervae Haeckel 1879

Diameter unknown. Stomach and lips larger than in *M. annae*; gonads along nearly entire length of radial canals. Tentacles 120–160; one cirrus between tentacles; 120–160 lithocysts, each with 8–12 concretions in a single row.

HAECKEL 1879, p. 189: *Mitrocoma minervae* n.sp.; South Africa. MAYER 1910, p. 288. ?VANHÖFFEN 1911*a*, p. 227: Nias and Nicobar Islands, Indian Ocean. KRAMP 1932, p. 352: doubtful species. KRAMP 1959*a*, p. 143.

Mitrocoma sp. Babnik 1948

BABNIK 1948, p. 27, fig. 6: *Mitrocoma* sp.; Adriatic Sea.

Genus ***Mitrocomella*** Haeckel 1879

Mitrocomidae with four radial canals; with eight, 12 or 16 lithocysts without ocelli; with marginal cirri which coil spirally.

Type-species: *M. polydiademata* (Romanes).

HAECKEL 1879, p. 184: *Mitrocomella* n.g.

Mitrocomella brownei (Kramp 1930)

Diameter 4–7 mm. Umbrella watch-glass-shaped or hemispherical; velum fairly broad. Stomach small, short, mouth with four small, simple lips; radial canals very narrow. Gonads oval, swollen, near distal end of radial canals. The number of tentacles is normally 16, but in large specimens 20 or 24 are found; 6–8 cirri between tentacles; eight lithocysts with 5–7 concretions in each.

KRAMP 1930, p. 23, figs. 9–11: as *Trissocoma brownei* n.g., n.sp.; S.W. North Sea. MAR. BIOL. ASS. 1931, p. 82: *Mitrocomella brownei*; Plymouth. KRAMP 1932, p. 341, figs. 9, 37: description and distribution. KRAMP 1933*a*, p. 566, fig. 29. KRAMP 1937*b*, p. 91, fig. 38*b*. REES & RUSSELL 1937, p. 75, figs. 9–10: rearing of the hydroid (*Cuspidella*); genus *Mitrocomella* possibly = *Cosmetira*; Plymouth. RUSSELL 1938*b*, pp. 413, 416, 418: Plymouth. RUSSELL 1938*d*, p. 156, figs. 60–5: nematocysts. RUSSELL 1953, p. 261, Pl. 15, fig. 4, text-figs. 150–5: England. NAUMOV 1956*a*, pp. 558–61, text-fig. 1*v*: development; medusa and hydroid. KRAMP 1958*a*, p. 121: Villefranche, Mediterranean. KRAMP 1959*a*, pp. 142, 215, 218, 224, fig. 169: diagnosis; distribution. WERNER 1959*a*, p. 33: Port Erin, Isle of Man.

Mitrocomella cruciata (Agassiz 1865)

Diameter 40–50 mm. Umbrella hemispherical or somewhat higher; stomach very small, with short lips. Gonads along distal part of radial canals. Tentacles about 100; cirri long, slender, spiral, one between tentacles; 12 lithocysts.

AGASSIZ 1865, p. 102, figs. 151, 152: as *Halopsis cruciata* n.sp.; Massachusetts Bay, U.S.A. MAYER 1910, p. 289: as *Mitrocoma cruciata.* BIGELOW 1914*b*, p. 14: as *Mitrocoma cruciata*, in part. KRAMP 1932, p. 343, fig. 39: synonyms and distribution; *Mitrocoma cruciata* Bigelow 1915*b* and 1926 – *Mitrocomella polydiademata.* KRAMP 1933*a*, p. 567, fig. 30. KRAMP 1959*a*, p. 143, fig. 172: diagnosis.

Mitrocomella frigida (Browne 1910)

Diameter 13–17 mm. Umbrella almost hemispherical, with thin walls. Stomach short and broad. Gonads along greater part of radial canals, leaving both ends free, hanging down in large vertical folds. 32–72 tentacles and between every two about eight cirri; eight lithocysts.

BROWNE 1910, p. 35: *Cosmetira frigida* n.sp.; McMurdo Bay, Antarctic. VANHÖFFEN 1912, p. 367, fig. 3: as *Cosmetira frigida*; Antarctic. KRAMP 1932, p. 345, fig. 23, Pl. 10, figs. 5, 6: *Mitrocomella frigida.* KRAMP 1948*a*, p. 4: South Georgia. KRAMP 1957*a*, pp. 30, 96, 97, 105, 124: W. of Cape of Good Hope; S. Georgia. KRAMP 1959*a*, pp. 142, 227, 230, 235, 237, 267, 269, fig. 170: diagnosis; distribution.

Mitrocomella fulva Browne 1903

Diameter about 6 mm; umbrella watch-glass-shaped. Stomach small, mouth with four short lips. Radial canals narrow. Gonads oval, 1/3 of the length of radial canals, very near the bell margin. Tentacles about 16 and some small bulbs; about four cirri between tentacles and bulbs; 16 large lithocysts, with 3–8 concretions.

BROWNE 1903, p. 17, Pl. 1, fig. 3, Pl. 3, figs. 1, 2: *Mitrocomella fulva* n.sp.; English Channel; Bergen, Norway. MAYER 1910, p. 290: as synonym of *Mitrocoma polydiademata.* MAR. BIOL. ASS. 1931, p. 82: as *Mitrocoma* (*Mitrocomella*) *fulva*; Channel. KRAMP 1932, p. 344. KRAMP 1933*a*, p. 566. RUSSELL 1938*b*, pp. 413, 416: Plymouth. KRAMP 1959*a*, p. 143: as synonym of *M. polydiademata.*

Mitrocomella polydiademata (Romanes 1876)

Diameter 12–30 mm; velum fairly broad. Stomach small, mouth with four short, simple lips. Radial canals narrow; gonads 2/3 – 4/5 of the length of radial canals, linear, with 3–4 bends to either side. Tentacles 36–48, in American specimens up to 64, as long as diameter of the bell, with long, tapering bulbs; cirri 5–9 or more between two successive tentacles; 16 lithocysts, each with 15–20 concretions.

ROMANES 1876*a*, p. 274: as *Tiaropsis polydiademata* n.sp.; Scotland. BROWNE 1910, p. 33: as *Mitrocomella polydiadema.* MAYER 1910, p. 290, fig. 157: as *Mitrocoma polydiademata*; (N.W. Europe). BIGELOW 1914*b*, p. 14: as *Mitrocoma cruciata*; Gulf of Maine, U.S.A. BIGELOW 1915*b*, pp. 316, 320: as *Mitrocoma cruciata*; off Nova Scotia, N. America. BIGELOW 1917, pp. 303, 304, 305: as *Mitrocoma cruciata*; Gulf of Maine, U.S.A. KRAMP 1919, p. 59, chart VI: as *Mitrocoma polydiademata.* BIGELOW 1922, pp. 133, 173: as *Mitrocoma cruciata*; Massachusetts Bay. KRAMP & DAMAS 1925, p. 296: as *Mitrocoma polydiademata*; Shetland Islands. BIGELOW 1926,

p. 348: as *Mitrocoma cruciata*; Gulf of Maine, U.S.A. KRAMP 1927, p. 109: as *Mitrocoma polydiademata*; Denmark. KRAMP 1930, p. 21: as *Mitrocoma polydiademata*; off Firth of Forth; Belgian coast. SANDERSON 1930, p. 226: as *Mitrocoma* (*Mitrocomella*) *fulva*; Northumberland coast. WATSON 1930, p. 234: as *Mitrocoma fulva*; Northumberland coast. KRAMP 1932, pp. 346–9, figs. 3, 5, 11, 18, 29, 30, 40, Pl. 10, figs. 3–4: synonyms and distribution. RUNNSTRÖM 1932, p. 29: as *Mitrocoma polydiademata*; Herdlafjord, Hjeltefjord, Norway. KRAMP 1933*a*, p. 565, fig. 28: distribution. BERNSTEIN 1934, pp. 9, 25, 51: Kara Sea. KRAMP 1937*b*, p. 91, fig. 38*a*: Denmark. MOORE 1937, p. 49: as *Mitrocoma* (*Mitrocomella*) *fulva*; Port Erin, Isle of Man. YASHNOV 1939, p. 112: Kara Sea. KRAMP 1942, p. 61: W. Greenland. FRASER 1949*b*, p. 66: northern North Sea. KRAMP 1947, p. 52: east coast of Scotland. YASHNOV 1948, p. 72, Pl. 20, fig. 4: Barents Sea; Kara Sea. FRASER 1952*b*, p. 104: northern North Sea. RUSSELL 1953, p. 257, figs. 147–9: British coasts. SOUTHWARD 1954, p. 19: Irish Sea. VANNUCCI 1956*b*, pp. 245, 246, 248: Clyde Sea, Scotland. KRAMP 1959*a*, pp. 143, 208, 211, 215, 216, 217, 219, 221, fig. 171: diagnosis; distribution. WERNER 1959*a*, p. 33: Port Erin, Isle of Man.

Mitrocomella sinuosa (Foerster 1923)

Diameter 4 mm. Stomach small, mouth large, wide, with four recurved lips. Radial canals narrow; gonads sinuous, along distal half of radial canals, distinctly longitudinally divided. Tentacles about 50, with thick, conical bulbs, fairly short; 3–5 cirri between tentacles; 12 lithocysts.

FOERSTER 1923, p. 35, Pl. 4, fig. 6: as *Mitrocoma sinuosa* n.sp.; Vancouver. KRAMP 1932, p. 343, fig. 38: as *Mitrocomella sinuosa*.

Genus ***Octogonade*** Zoja 1896

Mitrocomidae with eight radial canals; with numerous lithocysts, each with an ocellus; with two kinds of tentacles; without marginal cirri.

Type-species: *O. mediterranea* Zoja 1896.

Octogonade mediterranea Zoja 1896

Diameter 60–70 mm. Umbrella globular, velum fairly broad. Stomach small, tubular, octagonal, with eight small but distinct lips. Gonads along almost entire length of the eight narrow radial canals. 16 long and 150–160 small rudimentary tentacles, containing diverticula from the circular canal; lithocysts 50–60, each with a basal ocellus and with 12–20 concretions.

ZOJA 1896, pp. 101–6, figs. 1–6: as *Octogonade mediterranea* n.sp.; Mediterranean. MAYER 1910, p. 322, fig. 180. PELL 1918, pp. 22, 23, 26, fig. 2: Adriatic Sea. KRAMP 1932, p. 373, fig. 52: discussion. PELL 1938, p. 925: Adriatic Sea. KRAMP 1959*a*, pp. 146, 223, fig. 181: diagnosis; distribution.

Genus ***Tiaropsidium*** Torrey 1909

Mitrocomidae with four radial canals; with 8, 16 or 48 lithocysts, each with an ocellus; with two kinds of tentacles; without marginal cirri.

Type-species: *T. kelseyi* Torrey.

TORREY 1909, p. 19: *Tiaropsidium* n.g. MAYER 1910, p. 495: *Tiaropsis.* KRAMP 1932, p. 366.

Tiaropsidium atlanticum Russell 1956

60 mm wide, flatter than a hemisphere. Stomach small, four short, broad, slightly folded lips; gonads linear, along middle 3/4 of radial canals. Probably 24 large and 72 small tentacles; probably about 48 lithocysts, each with 12–20 concretions and a black ocellus. Mutilated specimen.

RUSSELL 1956*d*, pp. 494–8, text-figs. 2, 3: *Tiaropsidium atlanticum* n.sp.; off mouth of English Channel. KRAMP 1959*a*, pp. 145, 239, 240, fig. 180: diagnosis; distribution.

Tiaropsidium japonicum Kramp 1932

Diameter 18 mm. Velum narrow. Stomach small, flattened, funnels short and broad. Gonads along nearly entire length of radial canals. Eight large tentacles, with large, swollen bulbs, nematocysts evenly distributed; 6–7 small, pointed, rudimentary tentacles between two large tentacles; lithocysts 16, each with a dark-brown basal ocellus, number of concretions unknown.

KRAMP 1932, p. 370, figs. 1, 24, 36, Pl. 10, figs. 1–2: *Tiaropsidium japonicum* n.sp.; Misaki, Japan.

Tiaropsidium kelseyi Torrey 1909

Diameter about 50 mm. Umbrella about three times as broad as high, somewhat conical. Stomach short and fairly broad. Radial canals narrow. Gonads curtain-like, much folded, along almost entire length of radial canals. Eight fairly short tentacles; about 10–16 rudimentary tentacles in each quadrant; eight lithocysts, with ocelli.

TORREY 1909, p. 19, fig. 5: *Tiaropsidium kelseyi* n.g., n.sp.; California. MAYER 1910, p. 494: as *Tiaropsis kelseyi.* FOERSTER 1923, p. 37, Pl. 4, fig. 7: Vancouver Island. KRAMP 1932, p. 369, fig. 51.

Tiaropsidium mediterraneum (Metschnikoff 1886)

7 mm wide, 5 mm high, globular, jelly thick. Stomach short, fairly broad, with four short, simple lips; gonads elongated, on distal 2/3 of radial canals. Two opposite perradial, long tentacles and two small perradial bulbs; in each quadrant five rudimentary tentacles, smaller than the bulbs. Eight lithocysts, each with 20 or more concretions and a basal ocellus.

METSCHNIKOFF 1886, p. 239, Pl. 22, figs. 6–8: as *Tiaropsis mediterranea* n.sp.; Messina, Mediterranean. MAYER 1910, p. 260: as *Tiaropsis mediterranea.* STECHOW 1923, p. 131: as *Tiaropsis mediterranea.* KRAMP 1932, p. 367, fig. 49: *Tiaropsidium mediterraneum.* KRAMP 1959*a*, pp. 145, 223, fig. 179: diagnosis; distribution.

Tiaropsidium roseum (Maas 1905)

Diameter about 15 mm. Umbrella flattened, velum narrow. Stomach broad and flat, about 1/4 as broad as bell diameter; gonads elongated oval, along somewhat more than 1/3 of the length of the narrow radial canals. Four fairly long tentacles; seven rudimentary tentacles in each quadrant; eight lithocysts, with ocelli, each with about 15 concretions.

MAAS 1905, p. 30, Pl. 7, figs. 45–7: as *Tiaropsis rosea*; Malayan Archipelago. MAYER 1910, p. 260, Pl. 31, figs. 1–4: as *Tiaropsis rosea*; Tortugas, Florida. BROWNE 1916*a*, p. 186: as *Tiaropsis rosea*; Mauritius, Indian Ocean. KRAMP 1932, p. 368, figs. 2, 50: *Tiaropsidium roseum*; distribution, synonyms. KRAMP 1958*b*, p. 343: The Nicobars, Indian Ocean.

Genus ***Tiaropsis*** Agassiz 1849

Mitrocomidae with four radial canals; with eight lithocysts each with a basal ocellus; with only one kind of tentacles; without marginal cirri.

Type-species: *T. multicirrata* (Sars).

L. AGASSIZ 1849, p. 289: *Tiaropsis*, new genus for *Thaumantias multicirrata* Sars.

Tiaropsis multicirrata (M. Sars 1835)

Diameter about 20 mm. Umbrella flatter than a hemisphere; a broad, flat stomachal peduncle. Stomach fairly small; mouth with four lips, fairly long and broad; gonads somewhat sinuous, along middle 1/2 – 2/3 of the radial canals, from base of peduncle outwards. About 300 fairly short tentacles, with broad, swollen bulbs. Lithocysts eight, each with about 12 concretions and with a black ocellus at the base.

SARS 1835, p. 26, Pl. 5, figs. 12*a–c*: as *Thaumantias multicirrata*; Norway. MAYER 1910, pp. 258–9, Pl. 31, fig. 11, Pl. 32, figs. 8–9: as *T. diademata* and *T. multicirrata* (N.W. Europe); New England (*T. diademata*). BIGELOW 1913, p. 33: as *T. diademata*; northern Pacific. LE DANOIS 1913*b*, p. 22, fig. 8: Isafjord, Iceland. LE DANOIS 1913*c*, p. 352. LE DANOIS 1913*d*, p. 312: Isafjord, Iceland. BIGELOW 1914*b*, p. 13: as *T. diademata*; New England. BIGELOW 1914*d*, p. 407: as *T. diademata*; Massachusetts Bay, U.S.A. BIGELOW 1915*b*, pp. 316, 320: as *T. diademata*; near Cape Cod, U.S.A. KRAMP 1915: as *T. multicirrata*; Kattegat, Denmark. KRAMP 1919, p. 77, Pl. 4, figs. 6–10, text-figs. 11–14: development; new records: N.W. Europe; Iceland; W. Greenland; Newfoundland. KRAMP 1920*a*, p. 10: Newfoundland. PEACOCK 1923, p. 95: Cullercoats, England. USSING 1925, p. 73: Mariager fjord, Denmark. BIGELOW 1926, p. 43: as *T. diademata*; Gulf of Maine, U.S.A. FISH 1926, p. 123: as *T. diademata*; Woods Hole, U.S.A. KRAMP 1927, p. 111: Denmark. SANDERSON 1930, p. 227: Northumberland coast. WATSON 1930, p. 236: Northumberland coast. MAR. BIOL. ASS. 1931, p. 82: Plymouth. KRAMP 1932, p. 364, figs. 14, 15, 20, 35, 48: synonyms and distribution. RUNNSTRÖM 1932, p. 28: Herdlafjord, Hjeltefjord, Norway. THIEL 1932*a*, p. 144. THIEL 1932*b*, pp. 443 ff.: distribution. KRAMP 1933*a*, p. 572, fig. 36: distribution and synonyms. FROST 1937, p. 26: Newfoundland. KRAMP 1937*b*, p. 95, fig. 42: Denmark. MOORE 1937, p. 49: Port Erin, Isle of Man. RUSSELL 1938*b*, pp. 413, 416, 417, 429: Plymouth.

Yashnov 1939, pp. 112, 114: Chukotski Sea, N. of U.S.S.R. Kramp 1939*a*, p. 13: Iceland. Rees 1941*a*, p. 138, figs. 6, 7: description of the hydroid, a *Campanulina*, and the medusa; Millport, Scotland. Dunbar 1942, p. 74: east coast of Baffin Land. Kramp 1942, p. 65: W. Greenland. Yashnov 1948, p. 72, Pl. 20, fig. 6: Barents Sea; White Sea; Chukotski Sea; Bering Sea; Sea of Okhotsk. Naumov 1951, p. 749: hydroid reared; north of Russia. Künne 1952, pp. 11, 32, 39: south-east North Sea. Russell 1953, p. 278, Pl. 17, fig. 1, text-figs. 167–71: British coasts. Kramp 1955*b*, p. 156: Haeckel 1879 determ. *Thaumantias eschscholtzii* n. sp. Naumov 1956*b*, p. 37. Vannucci 1956*b*, pp. 245, 246, 248: Clyde Sea, Scotland. Petersen 1957, p. 38: E. Greenland. Carthy 1958, p. 242: responses to stimuli. Chow & Huang 1958, pp. 178, 189, Pl. 2, figs. 17, 18: Chefoo, China. Grainger 1959, pp. 471, 495: Iglooik, arctic Canada. Kramp 1959*a*, pp. 35, 145, 208, 211, 215, 216, 218, 219, 220, 221, 224, 226, 269, fig. 178: off the Bay of Cadiz; diagnosis; distribution.

Family *CAMPANULARIIDAE*

Leptomedusae with normal or reduced velum; with small stomach, without a peduncle; with normally four simple radial canals; with gonads completely surrounding radial canals, separated from stomach; with hollow, rarely solid, marginal tentacles; without excretory pores; without marginal or lateral cirri; with closed marginal vesicles; without ocelli. Hydroids *Campanularia*-like.

Genus ***Agastra*** Hartlaub 1897

Campanulariidae without manubrium and without marginal tentacles. Eight adradial statocysts. Four simple unbranched radial canals. Four sac-like, lobular gonads. Hydroid: *Orthopyxis*.

Type-species: *A. mira* Hartlaub.

Hartlaub 1897, p. 504: *Agastra* n.g. Mayer 1910, p. 234. Stechow 1919, p. 151: discussion of the name.

Agastra mira Hartlaub 1897

About 1 mm high and wide, bell-shaped, scattered nematocysts on exumbrella. Gonads in lateral, irregular lobes on middle half of radial canals. No tentacles, but four minute pigmented bulbs. Hydroid: *Orthopyxis caliculata.*

Hartlaub 1897, p. 504, Pl. 22, figs. 8–10: *Agastra mira* n.g., n.sp.; Heligoland; Plymouth. Mayer 1910, p. 234. Behner 1914, p. 395, fig. 11: comparison with *A. rubra* n.sp. Kramp 1930, p. 26: Dover, England. Mar. Biol. Ass. 1931, p. 82: Plymouth. Kramp 1933*a*, p. 575, fig. 39: all localities. Kramp 1937*b*, p. 101, fig. 44*a*. Russell 1938*b*, pp. 413, 416: Plymouth. Russell 1953, p. 303, Pl. 19, fig. 1, text-figs. 186–8: description of the hydroid, *Orthopyxis caliculata.* Kramp 1959*a*, pp. 146, 215, 218, 222, fig. 182: diagnosis; distribution.

Agastra rubra Behner 1914

0·8 mm high, 1 mm wide, with scattered nematocysts on exumbrella. Gonads on middle half of radial canals in broad, band-like dilatations, not in irregular lobes. No tentacles, but four minute bulbs. Hydroid: *Orthopyxis compressa*.

Behner 1914, p. 393, Pl. 7, fig. 6, text-figs. 8–10: *Agastra rubra* n.sp.; Naples, Italy. Kramp 1959*a*, pp. 146, 223, fig. 183: diagnosis; distribution.

Genus ***Eucopella*** von Lendenfeld 1883

Campanulariidae without manubrium and without tentacles. Exumbrella with longitudinal ridges. With four radial canals which give rise to blindly ending side branches. Gonads developed between branches of radial canals. With eight adradial lithocysts.

Type-species: *E. bilabiata* (Coughtrey 1875).

von Lendenfeld 1883, p. 497: *Eucopella* n.g. Mayer 1910, p. 232.

Eucopella bilabiata (Coughtrey 1875)

1·5 mm high, pyriform, thin walls; 30–40 meridional ridges on exumbrella; radial canals closed and obliterated near apex, with numerous side branches; bell cavity almost filled with genital organs. No trace of tentacles. Eight marginal vesicles with one concretion. Lives but a few hours.

Coughtrey 1875, p. 293, Pl. 20, fig. 45: as *Campanularia bilabiata* n.sp.; description of the hydroid; New Zealand. von Lendenfeld 1883, p. 497, Pls. 27–32: as *Eucopella campanularia* n.g.; south coast of Australia. Mayer 1910, p. 233, fig. 120. Kramp 1953, p. 309: the species retained.

Eucopella crenata Hartlaub 1901

Hydroid with medusae in gonotheca; the medusae contain the sex-cells before liberation.

Hartlaub 1901, p. 364, Pl. 22, figs. 27–31, 33–35: *Eucopella crenata* n.sp; New Zealand. Mayer 1910, p. 234: a variety of or identical with *E. bilabiata*?

Genus ***Gastroblasta*** Keller 1883

Campanulariidae with four or more radial canals and more than one manubrium. Numerous marginal vesicles alternating with tentacles. Centripetal canals from ring canal.

Type-species: *G. timida* Keller. Only species; all other species are abnormal specimens of *Phialidium*.

Keller 1883, p. 622: *Gastroblasta* n.g.

Gastroblasta timida Keller 1883

3–4 mm wide, 1–1·5 mm high; bell circular in outline. 1–4 manubria; 4–17 radial canals, 17 centripetal canals; 17 oval gonads. 68 tentacles and as many marginal vesicles, each with one concretion. (Retained as only species of *Gastroblasta*.)

KELLER 1883, p. 622, Pl. 35: *Gastroblasta timida* n.g., n.sp.; Red Sea. MAYER 1910, p. 279, fig. 151.

Genus *Obelia* Péron & Lesueur 1809

Campanulariidae with reduced velum; with solid marginal tentacles; with eight lithocysts.

Obelia spp.

Up to 6 mm wide, flat, jelly thin; velum rudimentary; stomach short, with quadrangular base, mouth with four short, simple lips; gonads round, saclike, on middle of radial canals; numerous short, solid tentacles, somewhat stiff, with axial core of single row of endoderm cells; each tentacle with small basal bulb and a short prolongation of endoderm into mesogloea of umbrella margin; eight adradial lithocysts, each situated on underside of basal bulb of marginal tentacle, each with one concretion.

MAYER 1910, p. 244: as *O. gelatinosa*; Atlantic and Mediterranean coasts of Europe; east coast of U.S.A. from Cape Cod to Carolina; p. 244, fig. 124: as *O. commissuralis*; from South Carolina to Maine, east coast of U.S.A.; p. 246, Pl. 30, figs. 1–4, text-figs. 125–7: as *O. dichotoma*; Atlantic coasts of Europe and U.S.A.; California; Alaska?; Australia and New Zealand?; p. 247: as *O. australis*; New S. Wales, Australia; New Zealand; p. 247, fig. 128: as *O. pyriformis*; from Massachusetts to S. Carolina, U.S.A.; p. 248: as *O. dubia*, =?*dichotoma*; Alaska; p. 248: as *O. striata*; tropical Pacific; p. 248, fig. 129: as *O. hyalina*; Zoblos Island; Bermudas; p. 249, fig. 130: as *O. plana*; British and Norwegian coasts; Massachusetts, U.S.A.; p. 249: as *O. borealis*; Alaska; p. 249, figs. 132, 133: as *O. geniculata*; Atlantic coasts of northern Europe and U.S.A. north of Carolina; Amboina, Malay Archipelago; Australia; New Zealand; Chile; Straits of Magellan; Kerguelen Island; Falkland Islands; coast of California; p. 252: as *O. griffini*; Puget Sound, Pacific coast of U.S.A.; p. 252: as *O. surcularis*; Puget Sound, Pacific coast of U.S.A.; p. 253: as *O. gracilis*; Puget Sound, U.S.A.; p. 253: as *O. corona*; California; p. 253: as *O. helgolandica*; Heligoland, North Sea; p. 254: as *O. adelungi*; Heligoland, North Sea; p. 254: as *O. bidentata*; New England, U.S.A.; Malay Archipelago; p. 255, fig. 134: as *O. longissima*; Atlantic coasts of Europe and North America north of Carolina; Iceland; Chile; Straits of Magellan; Alaska; p. 256: as *O. chinensis*; Yellow Sea, China; p. 256: as *O. nigra*; Nova Scotia, Canada; California; English, Scottish and Irish coasts; Norway; p. 257: as *O. serratula*; east coast of Australia; New Britain, South Pacific; p. 257: as *O. linearis*; tropical Pacific; p. 257: as *O. delicatula*; New Britain, South Pacific; p. 257: as *O. angulosa*; Parramatta River, Australia; p. 257: as *O. andersoni*; Mergui Archipelago, Indian Ocean. HADŽI 1911*b*, p. 476. HADŽI 1911*c*, p. 197, figs. 42, 43: Adriatic Sea. VANHÖFFEN 1911*a*, p. 222: as *O. geniculata*; Great Fish Bay and Cape of Good Hope, Africa; Kerguelen Island. NEPPI 1912,

p. 726, Pl. 3, figs. 8, 8*a*: as *O. adriatica* n.sp.; coast of Dalmatia, Adriatic Sea. Le Danois 1913*a*, p. 110: as *Obeliopsis fabre-domerguei* n.sp. Le Danois 1913*b*, p. 23, fig. 9: as *Obeliopsis fabre-domerguei*; Little Minch, Scotland. Le Danois 1913*c*, p. 352: as *Obeliopsis fabre-domerguei*. Le Danois 1913*d*, p. 312: as *Obeliopsis fabre-domerguei*; Shetland Islands. Neppi & Stiasny 1913*b*, p. 62: description of various forms of *Obelia*; Trieste, Adriatic Sea. Vanhöffen 1913*a*, p. 422: as *O. sphaerulina*, = *O. geniculata*; Tortugas, Florida. Bigelow 1914*b*, pp. 14, 15: as *O. geniculata, plana, longissima, gelatinosa, commissuralis* and *dichotoma*; New England, east coast of U.S.A. Bigelow 1915*b*, p. 316: south of Cape Cod, east coast of U.S.A. Int. Plankt. Catal. 1916, p. 43: as *O. nigra*; England; Ireland. Lebour 1916*a*, p. 51: *O.* sp. with larva of *Anaphia petiolata*; Plymouth. Lebour 1916*b*, pp. 57–9: with cercarias of *Pharyngora bacillaris*; Plymouth. Bigelow 1917, p. 303: Gulf of Maine, U.S.A. Lebour 1917, p. 161: Plymouth. Neppi 1918*a*, pp. 3, 4: as *O. geniculata*. Neppi 1918*b*, p. 192, figs. 1–11: as *O. geniculata*; Adriatic Sea. Pell 1918, p. 22: as *Obelia* α and β; pp. 22, 23, 25: as *O. adriatica*; Adriatic Sea. Kramp 1919, p. 89: as *O. nigra*; p. 90: *Obelia* sp.; northern Atlantic Ocean. Neppi 1919, p. 121: abnormal specimen; Naples. Kramp 1920*a*, p. 10: as *O. sargassi*; Sargasso Sea. Neppi 1920*b*, p. 90: abnormal specimen; Naples. Sverdrup 1921, p. 23: Kristianiafjord, Norway. Lebour 1922, p. 662: food. Foerster 1923, pp. 256–8: several species from Pacific coast of America. Lebour 1923, p. 80, fig. 4*c*: food. Peacock 1923, p. 94: as *O. geniculata*; Cullercoats, England. Coy 1924, p. 56: as *O. geniculata*; Cullercoats, England. Peacock 1924, p. 59: as *O. geniculata*; Cullercoats, England. Kramp & Damas 1925, p. 303: as *O. nigra*; Norway. Marshall 1925, p. 127: as *Obelia*; Clyde, Scotland. Ranson 1925*c*, p. 463, fig.: as *O. dichotoma*; St Waast, Channel. Russell 1925, p. 782: Plymouth. Uchida 1925*b*, p. 90: as *O. geniculata*; Japan. Fish 1926, pp. 123, 124: Woods Hole, east coast of U.S.A. Kramp 1927, p. 124: Denmark. Russell 1927, p. 571: Plymouth. Uchida 1927*b*, p. 221: Japan. Russell 1928, p. 85: Plymouth. Candeias 1930, p. 49: as *Obelia* sp.?; Portugal. Kramp 1930, p. 26: S.W. North Sea. Sanderson 1930, pp. 227, 236: Northumberland coast, England. Mar. Biol. Ass. 1931, p. 82: as *O. nigra* and *lucifera*; Plymouth. Menon 1931, p. 503: Madras, India. Russell 1931*b*, p. 771, tab. I: Plymouth. Savage 1931, pp. 40, 74, 76: east coast of England. Tu 1931, p. 86: Tsingtao and Chefoo, China. Menon 1932, p. 15, Pl. 2, fig. 22: Madras, India. Runnström 1932, p. 29: Herdla- and Hjeltefjord, Norway. Thiel 1932*a*, p. 145: as *O. nigra* and *geniculata*; p. 146: as *Obelia* sp. and *borealis*. Thiel 1932*b*, pp. 443 ff.: as *O. nigra* and *geniculata*; distribution. Dakin & Colefax 1933, p. 198: as *Obelia*; N.S. Wales, Australia. Kramp 1933*a*, p. 574, figs. 37, 38. Russell 1933, tab. I: Plymouth. Hovasse 1935, p. 61: ectoparasitism of peridinians on *O. dichotoma*; report. Künne 1935, p. 65: western Baltic Sea. Thiel 1935*c*, p. 164: as *O. geniculata*; hydroid only; Black Sea. Dawydoff 1936, p. 469: French Indochina. Frost 1937, p. 26: Newfoundland. Kramp 1937*b*, p. 99, fig. 43: Denmark. Künne 1937*b*, p. 6: Baltic Sea. Moore 1937, p. 50: as *O. lucifera*; Isle of Man. Pell 1938, p. 924: as *Obelia* α and β and *adriatica*; Adriatic Sea. Russell 1938*b*, pp. 413, 416, 419, 436: Plymouth. Thiel 1938*c*, p. 326: Magellan Strait, S. America; African localities: Cape Verde, Cape Verde Islands, between Cape Verde and Cape Blanco, Liberia and Fernando Po. Uchida 1938*a*, p. 145: Amakusa, Japan. Uchida 1938*b*, p. 42: Mutsu Bay, Japan. Browne & Kramp 1939, p. 294, Pl. 16, figs. 6–8: as *O. multicia*; p. 295, Pl. 16, figs. 9–12: as *Obelia* sp. (=*O. diaphana* Browne); Falkland Islands. Kramp 1939*a*, p. 14: as *O. nigra, geniculata* and *dichotoma*; Iceland. Yashnov 1939, p. 112: as *O. flabellata*; Chukotski Sea; Laptev Sea; Kara Sea; all localities north of U.S.S.R.

Kramp 1942, p. 67: W. Greenland. Menon 1945, p. 40: Trivandrum coast, India. Uchida 1947*a*, p. 304: Palao Islands, Pacific Ocean. Babnik 1948, p. 29: Adriatic Sea. Yashnov 1948, p. 73, Pl. 20, fig. 7: as *O flabellata*; p. 73: as *O. geniculata*; north of U.S.S.R.; Bering Sea. Sproston 1949, p. 139: as *O. geniculata*?; Chusan, China. Franc 1951, p. 28: as *O. dichotoma*; St Malo, Channel. Nair 1951, p. 61: Trivandrum coast, India. Deevey 1952*a*, p. 102: as *Obelia*; Block Island Sound, Conn., U.S.A. Deevey 1952*b*, pp. 150, 151: as *Obelia* sp.; Block Island Sound, Conn., U.S.A. Fraser 1952*b*, p. 104: off west coast of Scotland. Künne 1952, pp. 11, 30, 32, 39: S.E. North Sea. George 1953, p. 82: Calicut, southern India. Lubet 1953, p. 213: Arcachon, Bay of Biscay. Rees 1953*a*, p. 8: as *O. lucifera* and *nigra*; Herdlafjord, Norway. Russell 1953, p. 297, Pl. 18, figs. 1, 2, Pl. 19, fig. 2, text-figs. 182–5: British coasts. Chiu 1954*b*, p. 50: as *O. geniculata*; China. Southward 1954, p. 19: Irish Sea. Bernard 1955*b*, p. 13: Bay of Algiers, Morocco. Hure 1955, p. 6: as *O. dichotoma*; Adriatic Sea. Kramp 1955*a*, p. 254: Gulf of Guinea. MacGinitie 1955, pp. 42, 107, 119: breeding season; Point Barrow, Alaska Vannucci 1955, pp. 55–60, text-figs. 1, 2: *O. hyalina*, comparison with *O. griffini, dichotoma, commissuralis*; *O. griffini* = *O. hyalina*; description of the young medusa; São Paulo, Brazil. Naumov 1956*b*, pp. 37, 39: as *O. flabellata*; N.W. Pacific. Vannucci 1956*b*, pp. 244, 248: Clyde Sea, Scotland. Kramp 1957*a*, p. 33: False Bay, S. Africa. Valkanov 1957, p. 17: Black Sea. Vannucci 1957*d*, pp. 58, 90, 97, 98, 99, 102; Brazil. Vučetic 1957, p. 37: as *O. dichotoma*; rock pools, Mljet Island, Adriatic Sea. Aurich 1958, p. 215: frequency of occurrence in S.E. North Sea. Chow & Huang 1958, pp. 179, 189: as *O. gracilis*; Chefoo, China. Ganapati & Nagabhushanam 1958, pp. 92, 94: Vizagapatam coast, India. Kramp 1958*a*, p. 121: Villefranche, Mediterranean. Yamazi 1958, p. 136: as *O.* sp. 1 and sp. 2; Tanabe Bay, Japan. Kramp 1959*a*, pp. 147, 206, 268, fig. 184: as *O.* spp.; diagnosis; distribution. Kramp 1959*b*, p. 6: *O.* sp.; West Africa. Suarez-Caabro 1959, p. 27: *O.* sp.; Cuba, Caribbean Sea.

Genus ***Phialidium*** Leuckart 1856

Campanulariidae with normal velum; with hollow marginal tentacles; with numerous marginal vesicles.

Type-species: *P. hemisphaericum* (L.).

Leuckart 1856, p. 18: *Phialidium* n.g. Mayer 1910, p. 262: as *Clytia* Lamouroux 1812; p. 265: *Phialidium*. Vanhöffen 1911*a*, p. 224: revision. Vanhöffen 1913*b*, pp. 19, 20: *Phialidium*, incl. *Octocanna*, *Irenopsis* and *Pseudoclytia*; discussion. Kramp 1933*a*, p. 577: *Phialidium*, incl. *Clytia*.

Phialidium ambiguum (Agassiz & Mayer 1899)

4 mm wide, jelly very thick. Immature gonads near manubrium, which is flask-shaped, with four simple lips. 16 short tentacles with large bulbs; 1–2 statocysts between tentacles, with one concretion.

Agassiz & Mayer 1899, p. 167, Pl. 6, figs. 18, 19: as *Oceania ambigua* n.sp.; Fiji Islands, South Pacific Ocean. Mayer 1910, p. 274: *Phialidium ambiguum*.

Phialidium bicophorum (L. Agassiz 1862)

5·5 mm wide, 2–3 times as broad as high. Manubrium small, short, with four small, simple lips. Gonads spindle-shaped, in middle 1/4 of radial canals. 16 tentacles, 16 statocysts.

L. Agassiz 1862, pp. 304, 354, Pl. 29, figs. 6–9: as *Clytia bicophora* n.sp.; east coast of North America. Mayer 1910, p. 262, Pl. 32, figs. 1–7: as *C. volubilis*, in part; New England, U.S.A. Bigelow 1914*b*, p. 16: as *C. volubilis*; New England. Fish 1926, p. 125: as *C. ?bicophora*; Woods Hole, east coast of U.S.A. Kramp 1933*a*, p. 580, fig. 46: synonyms; distribution. Kramp 1959*a*, pp. 149, 211, 212, 231, 270, fig. 192: diagnosis; distribution.

Phialidium brunescens (Bigelow 1904)

2 mm wide, 0·7 mm high. Manubrium very short and broad, four lips. Gonads large, thick and prominent, proximal. About 30 short, thick tentacles; a prominent, brown pigment spot at base of each tentacle; 32–40 small statocysts with 1–2 concretions.

Bigelow 1904, p. 253, Pl. 1, fig. 2: as *Oceania brunescens* n.sp.; Maldive Islands, Indian Ocean. Mayer 1910, p. 274, fig. 148: *Phialidium brunescens*. Thiel 1938*c*, p. 329: south of St Paul Rocks, Central Atlantic Ocean. Vannucci 1951*b*, p. 106: report of Thiel. Kramp 1959*a*, pp. 150, 232, 233, 272, fig. 197: diagnosis; distribution.

Phialidium chengshanense (Ling 1937)

5–6 × 3·5–4 mm wide, flat, oval (young specimens circular). Up to six manubria. Usually four radial canals to each fully developed stomach, reaching ring canal; to each young stomach 2–3 canals, partly incomplete. No centripetal canals observed. Gonads ovoid, distal, 2–6 in number. Numerous well developed tentacles, alternating with rudimentary ones. Statocysts numerous. An abnormal *Phialidium.*

Uchida 1925*b*, p. 91, figs. 15, 16: as *Gastroblasta* sp.; Japan. Ling 1937, p. 356, figs. 6–8: as *G. raffaeli* var. *chengshanensis*, probably = *Gastroblasta* sp. Uchida 1925; Chekiang coast, China. Komai & Yamazi 1944, pp. 105–8, figs. 1–3: as *G. chengshanensis*; Japan. Chiu 1954*a*, p. 43, Pl. 2, figs. 5, 6: as *G. raffaeli* var. *chengshanensis*; Amoy, China. Chiu 1954*b*, pp. 49, 51, 52: as *G. raffaeli* var. *chenshanensis*; China. Chow & Huang 1958, pp. 181, 189: as *G. raffaeli* var. *chenshanensis*; Chefoo, China. Yamazi 1958, p. 136: as *G. chengshanensis*; Tanabe Bay, Japan.

Phialidium discoidum (Mayer 1900)

4 mm wide, almost hemispherical. Manubrium urn-shaped, with bulging sides, mouth with four recurved lips. Gonads on greater part of radial canals, thick, cylindrical, eggs very large; 16 very short tentacles with large basal bulbs; usually three statocysts between tentacles.

Mayer 1900*b*, p. 51, Pl. 20, figs. 53–5: as *Oceania discoida* n.sp.; Tortugas, Florida. Bigelow 1909*a*, p. 155, Pl. 6, fig. 8, Pl. 38, figs. 6, 7: *Phialidium discoida*; west coast of Mexico; West Indies. Mayer 1910, p. 272, Pl. 33, figs. 9–11: *P. discoidum*, according to Bigelow 1909 = *P. pacifica* Maas from Amboina, Malay Archipelago. Foerster 1923, p. 259. ?Uchida 1925*b*, p. 90, fig. 14: *P. discoida*?; Japan. Uchida

1927*b*, p. 221: *P. discoida*; Asamushi, Japan. UCHIDA 1938*b*, p. 42: *P. discoida*; Japan. UCHIDA 1947*a*, p. 304, fig. 6: central Pacific Ocean. KRAMP 1957*a*, pp. 33, 124: off Aracaju, Brazil. All records from Pacific waters probably erroneous. CHOW & HUANG 1958, pp. 179, 189, Pl. 2, figs. 19, 20: Chefoo, China. Probably erroneous. KRAMP 1959*a*, pp. 148, 232, 234, fig. 187: diagnosis; distribution.

Phialidium folleatum (McCrady 1857)

5 mm wide, hemispherical or somewhat flatter, thin. Manubrium small, four short, slightly recurved, lips. Gonads short, oval, distal; 16, rarely more, tentacles with tapering basal bulbs; statocysts alternating with tentacles, with one concretion.

MCCRADY 1857, p. 191: as *Epenthesis folleata* n.g., n.sp.; east coast of U.S.A. MAYER 1910, p. 264, Pl. 31, figs. 9, 10, Pl. 33, figs. 1–3, text-fig. 150B: as *Clytia folleata*; from Cape Hatteras to Florida, east coast of U.S.A. ?MAYER 1910, p. 278, Pl. 35, figs. 4–6, Pl. 36, fig. 7, text-fig. 150A: as *Pseudoclytia pentata* Mayer 1900*b*, from Tortugas, Florida. VANHÖFFEN 1913*a*, p. 422: as *C. folleata*; Florida. BIGELOW 1914*b*, p. 16: as *C. folleata*; New England, U.S.A. FISH 1926, p. 124: as *E. folleata*; Woods Hole, east coast of U.S.A. KRAMP 1933*a*, p. 581, fig. 47: *Phialidium folleatum*; distribution. ?VANNUCCI 1957*d*, p. 59: Brazil. KRAMP 1959*a*, pp. 149, 211, 231, fig. 191: diagnosis; distribution.

Phialidium gardineri (Browne 1905)

5 mm wide, jelly thin. Stomach small, four or five short lips. A small gonad on middle of each radial canal. Five radial canals, four of them about 90° apart, the fifth between two of the others. About 13–14 tentacles and somewhat more rudimentary bulbs, irregularly spaced. About 32 statocysts. Probably an abnormal specimen of a four-radiated form.

BROWNE 1905*a*, p. 731, Pl. 55, figs. 1–3: as *Pseudoclytia gardineri* n.sp.; Maldive Islands, Indian Ocean. MAYER 1910, p. 279: as *Ps. gardineri*; abnormal specimen of *Phialidium*? BURKENROAD 1931, p. 117.

Phialidium gelatinosum (Mayer 1900)

3·3 mm wide, 7 mm high, upper half part very thick. Manubrium long and slender, four prominent lips. Gonads linear, along proximal 1/3 – 2/5 of radial canals. 16 well developed and 16 rudimentary tentacles alternating with 32 statocysts with 3–5 concretions.

MAYER 1900*b*, p. 51, Pl. 10, figs. 20, 20*a*: as *Oceania gelatinosa* n.sp.; Tortugas, Florida. MAYER 1910, p. 272, Pl. 34, fig. 1: *Phialidium gelatinosum*. KRAMP 1959*a*, pp. 150, 231, fig. 194: diagnosis; distribution.

Phialidium globosum (Mayer 1900)

14 mm wide, globular, jelly very thick. Manubrium very short, four prominent lips. Gonads linear, wavy, along distal half of radial canals: 32

large tentacles and 32 rudimentary ones; 64 statocysts, each with 3–5 concretions.

Mayer 1900*b*, p. 51, Pl. 9, figs. 19, 19*a*: as *Oceania globosa* n.sp.; Tortugas, Florida. Mayer 1910, p. 272, Pl. 34, fig. 4: *Phialidium globosum*; in explanation of Pl. 34, fig. 4 *P. globulosum* (misprint). ?Ganapati & Nagabhushanam 1958, pp. 92, 94: Vizagapatam coast, India. Kramp 1959*a*, pp. 149, 231, fig. 193: diagnosis; distribution.

Phialidium gregarium (L. Agassiz 1862) *

12 mm wide, hemispherical. Stomach small, four very long, curved, fringed lips. Gonads linear, along distal half of radial canals. 60 tentacles with large, spherical bulbs; 1–2 statocysts between tentacles, each with one concretion.

L. Agassiz 1862, p. 353: as *Oceania gregaria* n.sp.; Puget Sound, Pacific coast of North America. Mayer 1910, p. 272: *Phialidium gregarium*. Foerster 1923, p. 259: as *Phialidium languidum*; San Diego; pp. 259–60: as *P. languidum* var. *gregarium*; description and discussion; Puget Sound. Strong 1925, p. 384, Pl. 37, figs. 1–6: development of hydroid and medusa; Puget Sound. Hyman 1940, p. 282: physiology; Puget Sound. Bonner 1955, pp. 18–20, fig. 1A–E: physiology; Puget Sound.

Phialidium hemisphaericum (L.)

Up to 20 mm wide, nearly hemispherical, jelly fairly thin. Stomach small, four short, simple lips. Gonads oval or linear, 1/2 to 3/4 of the length of radial canals, somewhat nearer to margin than to stomach. 16 or 30–58 tentacles with globular bulbs; 1–3, usually two, statocysts between tentacles, each with one concretion.

Linné 1767, p. 1098: as *Medusa hemisphaerica* n.sp. Forbes 1848, pp. 47–52, Pl. 8, figs. 2, 3, Pl. 10, fig. 1, Pl. 11, figs. 1, 2, 4, 5: as *Thaumantias hemisphaerica*, *thompsoni* (?), *sarnica*, *pileata*, *inconspicua*, *punctata*, *lineata*; British coasts. Mayer 1910, p. 262: as *Clytia volubilis*, in part; p. 266, figs. 140–4: *Phialidium hemisphaericum*. (Atlantic coasts of Europe); Mediterranean. ?Mayer 1910, p. 280: as *Gastroblasta raffaelei* Lang 1886; Naples, Italy. Hadži 1911*c*, p. 199, text-figs. 44–6: as *Clythia johnstoni*; Adriatic Sea. Neppi & Stiasny 1911, p. 398: as *T. hemisphaericum*; Trieste, Adriatic Sea. Neppi 1912, p. 728: as *P. variabile*; Adriatic Sea. Le Danois 1913*d*, p. 309, fig. 7: as *T. hemisphaericum*; Bay of Biscay; Faroes. Neppi & Stiasny 1913*a*, p. 241, figs. 1–7: as *P. variabile*, =*G. raffaelei*. Neppi 1913*b*, p. 66: as *P. variabile*; discussion; Trieste, Adriatic Sea. Lebour 1916*a*, p. 51: Plymouth; with larvae of *Anaphia petiolata*. Lebour 1916*b*, pp. 57–9: Plymouth; with cercarias of *Pharyngora bacillaris*. Int. Plankt. Catal. 1916, p. 43: as *P. temporarium*; England; Ireland. Lebour 1917, p. 161: Plymouth. Neppi 1918*a*, pp. 3, 4: as *P. variabile*. Neppi 1918*b*, p. 202, figs. 12, 13: as *P. variabile*; Adriatic Sea. Pell 1918, pp. 22, 26: as *P. variabile*; Adriatic Sea. Kramp 1919, p. 91, Pl. 4, fig. 14, Pl. 5, fig. 3, text-figs. 16, 17, chart XI: northern Atlantic Ocean. Neppi 1919, p. 121, figs. 3–5, 8, 9: as *P. variabile*; abnormal specimen; Naples. Neppi 1920*b*, p. 90: abnormal specimen; Naples. Sverdrup 1921, p. 24, fig. 3: *P. hemisphaericum*; p. 24, Pl. 4, fig. 17: ? as *Clytia volubilis*; Kristianiafjord, Norway. Lebour 1922, pp. 653, 663, fig. 1: food; Plymouth. Lebour 1923, p. 78: food; Plymouth. Peacock

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* See Addenda, p. 444.

1923, p. 95: Cullercoats, England. Coy 1924, p. 56: Cullercoats, England. Kramp 1924, p. 18: Bay of Cadiz, Spain; Mediterranean. Peacock 1924, p. 59: Cullercoats, England. Kramp & Damas 1925, p. 304: Norway. Marshall 1925, p. 127: Clyde, Scotland. Ranson 1925*a*, p. 89: English Channel. ?Ranson 1925*a*, p. 89: as *P. languidum*; English Channel. Russell 1925, p. 784: as *Phialidium* species, probably chiefly *P. hemisphaericum*; Plymouth. Ranson 1926, p. 296: English Channel. Kramp 1927, p. 114, fig. 2, map: Denmark. Russell 1927, p. 572: Plymouth. Russell 1928, p. 86: Plymouth. Kramp 1930, p. 27, map: S.W. North Sea; eastern Channel. Sanderson 1930, p. 228: Northumberland coast, England. Stiasny 1930*b*, p. 2: as *P. buskianum*, ?=*hemisphaericum*; Zuidersee, Holland. Watson 1930, p. 236: Northumberland coast, England. Mar. Biol. Ass. 1931, p. 82: *P. hemisphaericum*, =*P. temporarium* and *T. buskiana*; Plymouth. Russell 1931*b*, p. 771, tab. I: as *Phialidium* sp.; Plymouth. Savage 1931, pp. 31, 40: east coast of England. Runnström 1932, p. 29: Herdla- and Hjeltefjord, Norway. Thiel 1932*a*, p. 146. Thiel 1932*b*, pp. 443 ff.: distribution. Kramp 1933*a*, p. 579, figs. 42, 43, 44: synonyms and distribution. Kramp 1933*c*, p. 239: comparison with *P. languidum*. Ranson 1933*d*, p. 402: development; English Channel; off Spain. Ranson 1933*e*, figs. 1–5: Mediterranean. Russell 1933, p. 74, tab. I: Plymouth. Russell 1935*a*, p. 27: Plymouth. Kramp 1937*b*, p. 102, fig. 45; Denmark. Künne 1937*b*, p. 6: Baltic Sea. Moore 1937, p. 50: Isle of Man. Pell 1938, p. 924: as *P. variabile*; Adriatic Sea. Russell 1938*b*, pp. 413, 416, 419, 429, 437: Plymouth. Russell 1938*d*, p. 156, figs. 46–51: nematocysts. ?Thiel 1938*c*, p. 330: as *Pseudoclytia pentata* forma *hexaradiata*; S.W. of Capetown, S. Africa. Kramp 1939*a*, p. 14: Iceland. Kramp 1947, p. 52: between Shetland and Faroes; S.W. and S.E. of Iceland. Babnik 1948, p. 30: as *P. variabile*; p. 71: biological remarks; Adriatic Sea. ?Berrill 1950, p. 313, fig. 10 N: as *Gastroblasta raffaelei*; report. Kändler 1950, p. 68: Fehmarnbelt, western Baltic Sea. Franc 1951, p. 28: English Channel. Gotto 1951, p. 163: Ireland. Nair 1951, p. 61: Trivandrum coast, India. Künne 1952, pp. 11, 30, 32, 34, 40: S.E. North Sea. Fraser 1953, p. 33: from Storknes, Scotland, to Faxabay, Iceland. Kramp 1953, p. 271: Great Barrier Reef, Australia. Rees 1953*a*, p. 8: Herdlafjord, Norway. Russell 1953, p. 285, Pl. 16, fig. 1, Pl. 17, fig. 6, text-figs. 172–9: British coasts; p. 290: *Gastroblasta raffaelei* abnormal specimens of *P. hemisphaericum*. Hummelinck 1954, p. 165: no longer occurs in Zuidersee, Holland. Lubet 1954, p. 213: Arcachon, Bay of Biscay. Newell 1954, p. 330: Kent, England. Southward 1954, p. 19: Irish Sea. Kramp 1955*a*, p. 255: Canary Islands; off Liberia; Gulf of Guinea; p. 308: =*P. variabile* Haeckel from Canary Islands. Wiborg 1955, p. 53: as *Phialidium* sp.; near Faroes. Vannucci 1956*b*, pp. 244, 248: Clyde Sea, Scotland. Alvariño 1957*b*, p. 25: Atlantic coast of Spain and Portugal. Kramp 1957*a*, p. 33: comparison with *P. discoidum*. Aurich 1958, p. 215: frequency of occurrence in S.E. North Sea. Bossanyi 1958, p. 356: Northumberland, England. Ganapati & Nagabhushanam 1958, pp. 92, 93: Vizagapatam coast, India. Kramp 1958, pp. 121, 127: Villefranche, Mediterranean. Kramp 1959*a*, pp. 148, 215, 220, 223, 225, 227, 271, fig. 185: diagnosis; distribution. Werner 1959*a*, pp. 33, 36: Port Erin, Isle of Man.

Phialidium iridescens Maas 1906

4–5 mm wide, somewhat globular, jelly fairly thick, subumbrella iridescent. Stomach wide, quadrangular, mouth with four small, complexly folded lips; gonads spindle-shaped, along middle portion of radial canals. 16 well developed tentacles with broad, conical bases, and 16 small tentacles, large and small ones not regularly alternating; number and structure of statocysts unknown.

MAAS 1906*b*, p. 13, Pl. 1, fig. 6: *Phialidium iridescens* n.sp.; Antarctic Ocean. MAYER 1910, p. 273, fig. 147. VANHÖFFEN 1912, p. 353: ? = *Cosmetirella simplex*. THIEL 1931, p. 320: Weddell Sea, Antarctic. KRAMP 1932, p. 361: *P. iridescens* a doubtful species. THIEL 1932*b*, p. 477. KRAMP 1959*a*, pp. 150, 235, 269, fig. 196: diagnosis; distribution; provisionally referred to *Phialidium*.

Phialidium islandicum Kramp 1919

35–40 mm wide, watch-glass-shaped, jelly thin. Stomach very small, cruciform, mouth with four pointed, crenulated lips; four linear gonads, along almost entire length of radial canals. About 200 tentacles with swollen basal bulbs, alternating with statocysts.

?LE DANOIS 1913*b*, p. 19, fig. 6: as *Staurostoma laciniatum* var. *hybridum*; British coasts. ?LE DANOIS 1913*d*, p. 310: as *S. laciniatum* var. *hybridum*; from Bay of Biscay to Faroes. KRAMP 1919, p. 95, Pl. 4, figs. 11–13, Pl. 5, figs. 1, 2, chart XII: *Phialidium islandicum* n.sp.; Iceland. KRAMP & DAMAS 1925, p. 305: between Shetland and Norway. THIEL 1932*a*, p. 146. THIEL 1932*b*, pp. 443 ff.: distribution. KRAMP 1933*a*, p. 582, fig. 48: distribution. KRAMP 1939*a*, p. 15: Iceland. KRAMP 1947, p. 52: S.E. Iceland. FRASER 1949*a*, p. 27: from Scotland to Faroes. RUSSELL 1953, p. 294, figs. 180, 181. KRAMP 1959*a*, pp. 149, 215, 218, 221, 222, fig. 190: diagnosis; distribution.

Phialidium languidum (A. Agassiz 1862)

15–20 mm wide, flatter than a hemisphere, fairly thin, flexible. Manubrium small and tubular, four slightly recurved lips. Gonads linear along distal half of radial canals. 32 or more tentacles; usually about two statocysts between tentacles, each with one concretion. (? = *P. hemisphaericum*, but hydroids different.)

A. AGASSIZ 1862, p. 353: as *Oceania languida* n.sp. HAECKEL 1879, p. 188: *Phialidium languidum*. MAYER 1910, p. 269, Pl. 33, figs. 4–8, Pl. 34, fig. 5: *P. languidum*; New England, S. Carolina and Florida, east coast of U.S.A.; p. 495: ? = *P. lomae* Torrey 1909 from California. ? VANHÖFFEN 1913*a*, p. 423: *P. languidum*; Tortugas, Florida. BIGELOW 1914*a*, p. 125: Gulf of Maine, east coast of U.S.A. BIGELOW 1914*b*, p. 17: New England, east coast of U.S.A. BIGELOW 1915*b*, pp. 273, 316, 319, 320: Gulf of Maine, U.S.A. BIGELOW 1917, pp. 303, 304: Gulf of Maine, U.S.A. ?RANSON 1925*a*, p. 89: abnormal two-radiated form; English Channel. BIGELOW 1926, pp. 29, 46, 47, 350, map: Gulf of Maine. FISH 1926, p. 125: as *O. languida*; Woods Hole, east coast of U.S.A. KRAMP 1933*a*, p. 580, fig. 45: distribution. KRAMP 1933*c*, p. 239: comparison with *P. hemisphaericum*. RANSON 1949, p. 125: *P. languidum* probably a valid species; Senegal, W. Africa. KRAMP 1955*a*, pp. 256, 310: *P. languidum* Ranson 1949 probably = *P. hemisphaericum*. KRAMP 1959*a*, pp. 148, 211, 212, 231, fig. 186: diagnosis; distribution.

Phialidium lomae Torrey 1909

9–12, rarely 14 mm wide, about four times broader than high, thin.

Manubrium short, cruciform, with four slightly frilled lips. Gonads narrow, on less than half the distal part of radial canals. 28–37 tentacles and some young bulbs; one, rarely 2, statocysts between adjoining tentacles, each with one concretion.

TORREY 1909, p. 22, fig. 8: *Phialidium lomae* n.sp.; San Diego, California. MAYER 1910, p. 495: *P. lomae* = *P. languidum*. KRAMP 1952, p. 7, figs. 3–5: *P. lomae* a valid species; Chile.

Phialidium malayense nov. nom.

5 mm wide. Stomach large, globular; mouth with four prominent lips. Four large, oval gonads on middle 1/3 of radial canals. 32 or more equally spaced tentacles; 0–2 statocysts between tentacles.

MAAS 1906*a*, p. 91, Pl. 2, fig. 7: as *Phialidium pacificum* (Agassiz & Mayer); Amboina, Malayan Archipelago. MAYER 1910, p. 273: ?? = *P. pacificum* (Agassiz & Mayer). MAYER 1915*a*, p. 201, Pl. 2, fig. 3: as *P. pacificum*; Torres Strait, Australia. KRAMP 1953, p. 311: *P. pacificum* Mayer 1915 probably = *P. pacificum* Maas 1906, non = *P. pacificum* (Agassiz & Mayer). CHIU 1954*b*, p. 55: as *P. pacificum*; China.

Phialidium mccradyi (Brooks 1888)

15 mm wide, about twice as broad as high. Manubrium short and stout, four recurved lips. Four small gonads on middle part of radial canals; the gonads may develop hydroid blastostyles which give rise to medusae. 16–24 tentacles with conical basal bulbs; 1–2 statocysts between tentacles, each with one concretion.

BROOKS 1888, pp. 29, 30: as *Epenthesis mccradyi* n.sp.; Bahama Islands. MAYER 1910, p. 271, Pl. 34, figs, 2, 3, Pl. 35, figs. 1–3: *Phialidium mccradyi*; (Tortugas, Florida; Bahamas.) VANHÖFFEN 1913*a*, p. 423: Tortugas, Florida. BERRILL 1950, p. 313, figs. 10 I–K: report. KRAMP 1957*a*, p. 13. KRAMP 1959*a*, pp. 8, 149, 231, fig. 188: diagnosis; distribution.

Phialidium noliforme (McCrady 1857)

Newly hatched medusa: bell-shaped, as high as wide; numerous nematocysts on exumbrella; stomach small, spherical, with narrow mouth-tube, no lips; no trace of gonads, unlike newly hatched medusae of *P. hemisphaericum*. Four perradial tentacles, four minute interradial bulbs; eight statocysts.

MCCRADY 1857, pp. 192, 194, 196, 216, Pl. 11, fig. 4: as *Campanularia noliformis* n.sp.; hydroid; South Carolina, U.S.A. L. AGASSIZ 1862, pp. 306, 354: as *Platypyxis cylindrica*, hydroid. ALLMAN 1864, p. 372: as *Campanularia cylindrica*, hydroid. BEDOT 1912, p. 264: as *Campanularia cylindrica*, synonym of *Clytia noliformis* (hydroid). BEDOT 1925, p. 150: as *Clytia noliformis*, hydroid. PICARD 1949, pp. 186–90, text-figs. 1, 2: as *Clytia noliformis*, hydroid and newly hatched medusa; Villefranche-sur-Mer, Mediterranean. BRIAN & PÉRÈS 1953, p. 149: Golfe de Lion, Mediterranean. VANNUCCI & RIBEIRO 1955, pp. 69–80, text-figs. 1–8: as *Clytia cylindrica*, medusa reared; Brazil. VANNUCCI 1957*d*, pp. 59, 90, 97, 98, 99, 103: as

Clytia cylindrica; Brazil. KRAMP 1959*a*, pp. 151, 223, 232, 234: diagnosis; distribution.

Phialidium ovale (Mayer 1900)

2·4–4 mm wide. Bell elliptical in outline; a single, straight canal along major axis of bell. Up to four manubria along the canal; two small gonads near ends of canal. 20–25 short tentacles; marginal vesicles slightly more numerous than tentacles, with one concretion. Abnormal *Phialidium*.

MAYER 1900*b*, p. 54, Pl. 39, figs. 129, 130: as *Multioralis ovalis* n.g., n.sp.; Tortugas, Florida. MAYER 1910, p. 281, Pl. 35, figs. 7, 8: as *Gastroblasta ovalis*. VANNUCCI 1949, p. 225, Pl. 1, fig. 3: as *G. ovalis*; San Sebastião, Brazil. BERRILL 1950, p. 313, figs. 10 L–M: as *G. ovalis*; report. VANNUCCI 1951*b*, pp. 115, 116: as *G. ovalis*; Brazil. KRAMP 1959*a*, pp. 151, 232, 234, fig. 198: as *Phialidium ovalis*; diagnosis; distribution.

Phialidium pacificum (Agassiz & Mayer 1899)

6 mm wide, hemispherical, moderately thick, but flexible. Manubrium short, eight simple lips. Small immature gonads on middle region of radial canals. 16 thin, flexible tentacles with large bulbs; two statocysts between tentacles, each with one concretion.

AGASSIZ & MAYER 1899, p. 167, Pl. 5, fig. 17: as *Oceania pacifica* n.sp.; Fiji Islands, Pacific Ocean. MAYER 1910, p. 273: *Phialidium pacificum*, ?=*P. pacificum* Maas 1906*a*, from Amboina, Malayan Archipelago. KRAMP 1953, p. 311: discussion.

Phialidium phosphoricum (Péron & Lesueur 1809)

VANHÖFFEN 1911*a*, p. 224: *P. phosphoricum* Péron & Lesueur, comprising all species of *Phialidium* with marginal vesicles in same number as tentacles. VANHÖFFEN 1913*b* p. 19: Ibid.

Phialidium rangiroae (Agassiz & Mayer 1902)

7 mm wide, flatter than a hemisphere, walls thin and flexible. Stomach very short, quadrate, not cruciform, four slightly recurved lips. Gonads small, oval, near margin. 16 well developed tentacles with large, conical bulbs; 16 statocysts, each with one concretion.

AGASSIZ & MAYER 1902, p. 145, Pl. 1, fig. 4: as *Epenthesis rangiroae* n.sp.; Rangiroa Island, Paumotus, South Pacific Ocean. MAYER 1910, p. 265: as *Clytia rangiroae*. KRAMP 1953, p. 273: *Phialidium rangiroae*; N.E. Australia.

Phialidium simplex Browne 1902

Up to 22 mm wide, 10 mm high, watch-glass-shaped. Stomach short with four large fimbriated lips. Gonads along distal 1/2 to 3/4 of radial canals, linear, slightly folded. 60–85 tentacles with globular bulbs, and a few young bulbs. One statocyst between tentacles, each with one concretion. Specimens seen with three and six radial canals.

BROWNE 1902, p. 282: *Phialidium simplex* n.sp.; Falkland Islands. MAYER 1910, p. 274. THIEL 1938*c*, p. 328: off mouth of Rio Grande do Sul, Brazil. BROWNE & KRAMP 1939, p. 299, Pl. 17, figs. 5–9: Falkland Islands. KRAMP 1948*a*, p. 5: Falkland Islands. VANNUCCI 1951*b*, pp. 112, 115, 116. KRAMP 1953, p. 272: N.E. Australia. KRAMP 1957*a*, pp. 33, 97, 124: S. coast of Africa. KRAMP 1959*a*, pp. 149, 227, 230, 232, 234, 235, 237, 267, 269, fig. 189: diagnosis; distribution.

Phialidium singulare (Mayer 1900)

2 mm wide, sides quite straight and sloping, near apex a sharp constriction above which is a lens-shaped, apical projection. Manubrium quadrangular, with four simple lips. Gonads short, near base of stomach. 16 well developed tentacles and 16 rudimentary bulbs; 32 statocysts, each with one concretion.

MAYER 1900*a*, p. 7, Pl. 4, figs. 12, 13: as *Oceania singularis* n.sp; Rhode Island, east coast of U.S.A. MAYER 1910, p. 273, Pl. 35, figs. 9, 10: *Phialidium singularis*. BIGELOW 1914*b*, p. 18. KRAMP 1959*a*. pp. 150, 211, 213, fig. 195: diagnosis; distribution.

Phialidium uchidai nov. nom

10 mm wide; low-dome-like. Manubrium four-sided. Gonads near, but not reaching circular vessel, oval to oblong. 16–28 short tentacles, tentacle bulbs less prominent than in other species; 24–42 statocysts, irregularly placed.

UCHIDA 1947*a*, p. 305, fig. 7: *Phialidium simplex* n.sp.; Palao Islands, Pacific Ocean.

Family *LOVENELLIDAE*

Leptomedusae with small stomach; without peduncle; with four simple radial canals; with gonads on radial canals separated from stomach; with hollow marginal tentacles; without excretory pores; with lateral or marginal cirri; with closed marginal vesicles; without ocelli. Hydroids, where known, *Lovenella*-like, hydrotheca with operculum.

Genus ***Cirrholovenia*** Kramp 1959

Lovenellidae with marginal cirri, without lateral cirri.

Type-species: *C. polynema* Kramp.

KRAMP 1959*c*, p. 250: *Cirrholovenia* n.g.

Cirrholovenia polynema Kramp 1959

Up to 7 mm wide, about hemispherical, jelly fairly thick; velum very broad. Stomach square, mouth with four slightly crenulated lips. Gonads linear, along middle half of radial canals. About 24 tentacles; up to eight marginal cirri between successive tentacles, long, spirally coiled; about 48 marginal vesicles with one concretion.

KRAMP 1959*c*, p. 251, fig. 16*a-c*: *C. polynema* n.g., n.sp.; Philippines; Java Sea.

Cirrholovenia tetranema Kramp 1959 *

Up to 1·5 mm high and wide, jelly thin, velum narrow. Stomach small, cruciform, mouth with very short, simple lips. Gonads thick, cylindrical, along almost whole length of radial canals. Four long perradial tentacles with broad basal bulbs; no rudimentary bulbs; 7–8 marginal cirri in each quadrant; four interradial or eight adradial marginal vesicles.

KRAMP 1959*c*, p. 243, fig. 17*a*, *b*: *C. tetranema* n.sp.; Strait of Malacca; Gulf of Siam; Philippines; Bali; Solomon Islands.

Genus **Eucheilota** McCrady 1857

Lovenellidae with lateral cirri; without marginal cirri; with fixed number of marginal vesicles, usually eight, occasionally four or 12.

Type-species: *E. ventricularis* McCrady.

MCCRADY 1857, p. 85: *Eucheilota* n.g. MAYER 1910, p. 281.

Eucheilota bakeri (Torrey 1909)

Young medusa: four marginal vesicles. Two gonads. Two well developed and two small tentacles, the two large ones with a pair of lateral cirri. Hydroid a *Campanularia*.

TORREY 1909, p. 21, fig. 7: as *Phialium bakeri* n.sp.; hydroid and young medusa; California. MAYER 1910, p. 495: *Eucheilota bakeri*. FOERSTER 1923, p. 261.

Eucheilota comata (Bigelow 1909)

6–12 mm wide, somewhat higher than a hemisphere, thick. Manubrium short, flask-shaped, four slightly crenulated lips, low peduncle; gonads linear from middle 1/3 to near distal end of radial canals. 17 tentacles and 23 rudimentary bulbs (in Pacific specimens) or 19 tentacles and 62 rudimentary bulbs (in West Indian specimens), each flanked by 1–3 pairs of lateral cirri; 7–14 large statocysts.

BIGELOW 1909*a*, p. 158, Pl. 5, figs. 6, 7, Pl. 6, fig. 9, Pl. 37, figs. 9, 10, 12: as *Phialucium comata* n.sp.; Mexico Pacific; West Indies. MAYER 1910, p. 276: as *Phialucium comata*; may more properly be called *Phialopsis comata*. VANHÖFFEN 1911*a*, p. 226: as *Phialopsis comata*. FOERSTER 1923, p. 261: as *Phialucium comata*. KRAMP 1936*b*, p. 243: should probably be referred to *Mitrocomium*. KRAMP 1959*a*, pp. 155, 232, 233, 270: as *Eucheilota comata*; diagnosis; distribution. ?KRAMP 1959*c*, p. 245: Mexico Pacific.

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* See Addenda, p. 444.

Eucheilota diademata Kramp 1959

3 mm wide (young medusa), watch-glass-shaped; velum narrow. Manubrium bottle-shaped; no gonads. Two opposite, perradial tentacles with conical bulbs, with one pair of lateral cirri and without pigmentation; 29 rudimentary marginal bulbs with one pair of cirri and each with a distinct black spot on the extreme tip. Eight marginal vesicles with three concretions.

KRAMP 1959*c*, p. 249, fig. 15: *E. diademata* n.sp; Philippines.

Eucheilota duodecimalis A. Agassiz 1862

2·5 mm wide, higher than a hemisphere. Manubrium very short. Gonads along distal half of radial canals. 12 marginal vesicles, each with one concretion. Four tentacles with one pair of lateral cirri.

A. AGASSIZ 1862, p. 353: *Eucheilota duodecimalis* n.sp.; New England, east coast of U.S.A. MAYER 1910, p. 283, Pl. 36, fig. 6, Pl. 37, figs. 1, 2, text-fig. 151: New England; South Carolina; Florida; (Pacific coast of Mexico). BIGELOW 1914*b*, p. 17: as *Phialium duodecimalis*; New England. FOERSTER 1923, p. 260: as *Phialium duodecimalis*. KRAMP 1933*a*, p. 584, fig. 53: distribution. KRAMP 1959*a*, pp. 154, 211, 231, 270, fig. 208: diagnosis; distribution.

Eucheilota flevensis van Kampen 1922

Size? No black spots on manubrium. 16 tentacles, clearly separated from the bulbs, each with two pairs of lateral cirri. Eight statocysts.

VAN KAMPEN 1922, p. 212, figs. 1, 2: *Eucheilota flevensis* n.sp; Zuiderzee, Holland. HUMMELINCK 1954, p. 165: no longer occurs in Zuiderzee, Holland. KRAMP 1959*a*, pp. 154, 215, 217, 222: diagnosis; distribution.

Eucheilota maasi Neppi & Stiasny 1911

3–5 mm wide, 3 mm high, jelly thick. Stomach cylindrical, half as long as bell cavity. Small (young) gonads on middle of radial canals. Four tentacles with thick, round bulbs with one pair of lateral cirri, and a number of rudimentary bulbs, some of which have cirri. Eight statocysts, each with one concretion.

NEPPI & STIASNY 1911, p. 397: *Eucheilota maasi* n.sp.; Trieste, Adriatic Sea. NEPPI & STIASNY 1913*b*, p. 68, Pl. 3, figs. 32, 33: Trieste. PELL 1918, pp. 22, 23, 26: Adriatic Sea. RUSSELL 1936*b*, p. 594: possibly – *E. hartlaubi* Russell 1936. PELL 1938, p. 925: Adriatic Sea. KRAMP 1959*a*, pp. 154, 223: diagnosis; distribution.

Eucheilota maculata Hartlaub 1894

Up to 13 mm wide, 10 mm high; flatter than a hemisphere. Stomach small, with four large, interradial, black spots; four well developed lips. Gonads linear, on distal 2/3 of radial canals. 16–30 long tentacles, each with a pair of spiral, lateral cirri; 1–3 rudimentary bulbs between successive tentacles; eight marginal vesicles, each with 5–10 concretions.

HARTLAUB 1894, p. 193: *Euchilota maculata* n.sp.; Heligoland, North Sea. MAYER 1910, p. 285. APSTEIN 1913, p. 612: remarks on development of gonads. KRAMP 1919, p. 97. KRAMP 1926*b*, p. 244: *E. maculata* is not the medusa of *Campanulina hincksi*, as supposed by Hartlaub. RANSON 1926, p. 297: St Waast, English Channel. KRAMP 1927, p. 123: Denmark. KRAMP 1930, p. 28: S.W. North Sea. KRAMP 1933*a*, p. 583, fig. 51: distribution. RANSON 1934*a*, p. 68: St Waast, English Channel. KRAMP 1937*b*, p. 105, fig. 47: Denmark. REES 1939*b*, pp. 442, 443: discussion. MAADEN 1942*a*, p. 354: Holland. KÜNNE 1952, pp. 11, 30, 32, 34, 40: S.E. North Sea. RUSSELL 1953, p. 311, figs. 193–5: English Channel. AURICH 1958, p. 215: frequency of occurrence in S.E. North Sea. KRAMP 1959*a*, pp. 154, 215, 218, 222, fig. 206: diagnosis; distribution.

Eucheilota menoni Kramp 1959

2·5 mm wide, hemispherical, jelly fairly thick; velum very broad. Globular gonads with large ova between middle and distal portion of radial canals. Four large perradial tentacles with 1–2 pairs of lateral cirri, four large interradial and 16 very small rudimentary bulbs without cirri. Eight adradial marginal vesicles with one concretion. Lateral walls of stomach with black pigment granules; perradial and interradial marginal bulbs with black pigment.

MENON 1932, p. 17, Pl. 1, fig. 9: as *Eucheilota* sp. II; Madras, India. KRAMP 1959*c*, p. 248, fig. 14*a*, *b*: *E. menoni* n.sp.; Nicobar Islands; Strait of Malacca; Philippines; Java Sea.

Eucheilota paradoxica Mayer 1900

4 mm wide, higher than a hemisphere. Manubrium small, flask-shaped. Gonads along middle portion of canals, medusa-buds on gonads. Four large tentacles with a pair of lateral cirri; four or more rudimentary bulbs flanked by cirri. Eight marginal vesicles with one concretion.

MAYER 1900*b*, p. 56, Pl. 40, figs. 134–6: *Eucheilota paradoxica* n.sp.; Florida; Bahamas. MAYER 1910, p. 285, Pl. 37, figs. 3–3″. UCHIDA 1938*a*, p. 146: Japan. UCHIDA 1938*b*, p. 41: Japan. BERRILL 1950, p. 311, fig. 10 G. H. YAMAZI 1958, p. 136: Tanabe Bay, Japan. KRAMP 1959*a*, pp. 154, 231, 272, fig. 207: diagnosis; distribution. KRAMP 1959*c*, p. 245: Strait of Malacca; Bali; Japan.

Eucheilota tropica Kramp 1959

4 mm wide, 1·5 mm high, apical jelly thick; velum narrow. Manubrium short; gonads elongated, along almost entire length of radial canals. Four large perradial tentacles and in each quadrant up to five rudimentary bulbs, the interradial larger than the others and sometimes developed into tentacles; tentacles and marginal bulbs with one pair of lateral cirri and without black pigmentation Eight marginal vesicles with 1–3 concretions.

MENON 1932, p. 17, Pl. 1, fig. 6: as *Eucheilota* sp. I; Madras, India. KRAMP 1959*c*, p. 247, fig. 13: *E. tropica* n.sp.; Nicobar Islands; Philippines.

Eucheilota ventricularis McCrady 1857

10 mm wide, hemispherical. Manubrium short, four prominent lips. Gonads linear, along middle 1/3 of radial canals. 16 tentacles and 16 rudimentary bulbs, all with a pair of lateral cirri; also about 24 minute knobs without cirri. Eight statocysts, each with about eight concretions.

MCCRADY 1857, p. 85, Pl. 11, figs. 1, 2, Pl. 12, figs. 1–3: *Eucheilota ventricularis* n.g., n.sp.; South Carolina, U.S.A. MAYER 1910, p. 282, Pl. 37, fig. 5, Pl. 38, fig. 1: southern New England; Florida. VANHÖFFEN 1911*a*, p. 228, fig. 18: Great Fishbay, W. Africa; (Chagos Islands, Indian Ocean; Red Sea; doubtful records). BIGELOW 1914*b*, p. 16: New England, U.S.A. KRAMP 1933*a*, p. 584, fig. 52: distribution. KRAMP 1942, p. 67: W. Greenland. KRAMP 1955*a*, p. 309: report of Vanhöffen's specimens 1902 from Great Fishbay; identification uncertain. VANNUCCI 1957*d*, pp. 61, 91, 97, 98, 99, 103, figs. 6, 7: Brazil. KRAMP 1959*a*, pp. 154, 208, 210, 211, 214, 224, 227, 231, fig. 205: diagnosis; distribution. KRAMP 1959*b*, p. 7: Rio de Oro, W. Africa; Vanhöffen's record from Great Fishbay probably correct. KRAMP 1959*c*, p. 244: Strait of Malacca; Gulf of Siam; Solomon Islands; young specimens, identification uncertain.

Eucheilota sp. juv.

1 mm wide, 0·5 mm high, jelly fairly thick, velum fairly broad. Manubrium bottle-shaped, hardly as long as bell cavity, mouth with four very small lips; no gonads. Two large opposite and six smaller perradial and interradial tentacles with large, conical basal bulbs, each with one pair of lateral cirri, and eight small, conical adradial bulbs without cirri. Eight marginal vesicles.

KRAMP 1959*c*, p. 250: *Eucheilota* sp. juv.; Gulf of Siam.

Genus ***Lovenella*** Hincks 1868

Lovenellidae with lateral cirri, without marginal cirri; with indefinite number of marginal vesicles, 16 or more when adult. Hydroid: *Lovenella*.

Type-species: *L. clausa* (Lovén).

HINCKS 1868, p. 177: *Lovenella* n.g.; hydroid. RUSSELL 1953, p. 306: *Lovenella*.

Lovenella annae (von Lendenfeld 1884)

5 mm wide, 2·5 mm high. Stomach small, globular, with four dark interradial spots. A short peduncle; four simple lips. Four oval gonads near ring canal, attached by a narrow neck. Eight tentacles with globular bulbs, with lateral clusters of short cirri; bulb with an abaxial black ocellus. 16 lithocysts. Doubtful species.

VON LENDENFELD 1884*a*, p. 606, Pl. 29, figs. 56–60: as *Mitrocomium annae* n.sp.; Port Jackson, Australia. MAYER 1910, p. 290: as *Mitrocoma lendenfeldi* nov. nom. KRAMP 1953, p. 310: probably an *Eucheilota*.

Lovenella assimilis (Browne 1905)

2·5 mm wide, a little broader than wide, jelly fairly thick. Stomach short with a quadrangular base; gonads large oval sacs, longitudinally divided, close by ring canal. Four tentacles with large basal bulbs, each flanked by 3–4 pairs of lateral cirri; in each quadrant about five rudimentary bulbs, the median one the largest, and about five marginal vesicles with two concretions.

BROWNE 1905*b*, p. 137, Pl. 1, fig. 3: as *Mitrocomium assimile* n.sp.; Ceylon. MAYER 1910, p. 288: ? young specimen of *Mitrocoma cirrata*. CHOW & HUANG 1958, pp. 182, 191, Pl. 4, figs. 31, 32: *Lovenella assimile* a valid species, referred to *Lovenella*; Chefoo, China. ?KRAMP 1959*c*, p. 246: Philippines.

Lovenella bermudensis (Fewkes 1883)

6 mm wide, higher than a hemisphere. Manubrium short, wide, four slightly recurved lips. Four swollen gonads near stomach. Eight tentacles with one pair of lateral cirri; between successive tentacles up to six rudimentary marginal warts, some of which carry one lateral cirrus; about 32 marginal vesicles, each with one concretion.

FEWKES 1883, p. 86, Pl. 1, figs. 8–10: as *Oceanopsis bermudensis* n.sp.; Bermuda. MAYER 1910, p. 282, Pl. 37, fig. 4, Pl. 38, figs. 2, 3: as *Eucheilota bermudensis*; Florida. KRAMP 1959*a*, pp. 153, 231, 233, fig. 204: as *Lovenella bermudensis*; diagnosis; distribution.

Lovenella chiquitita Millard 1959

0·4 mm wide, 0·3 mm high, jelly thin. Stomach short, with simple, quadrangular mouth; no gonads. Eight tentacles, the perradial larger than the interradial, without lateral or marginal cirri; eight marginal vesicles with two concretions.

MILLARD 1959, p. 250, fig. 3: *L. chiquitita* n.sp., hydroid and newly liberated medusa; Capetown harbour.

Lovenella cirrata (Haeckel 1879)

16 mm wide, nearly hemispherical. Stomach short, urn-shaped, four lips; four spindle-shaped gonads on distal half of radial canals. 8–16 tentacles with large bulbs flanked by 3–4 pairs of spiral cirri; usually three rudimentary marginal warts between successive tentacles; about 16 marginal vesicles, each with about three concretions.

HAECKEL 1879, p. 182, Pl. 11, figs. 9–11: as *Mitrocomium cirratum* n.sp.; Mediterranean. MAYER 1910, p. 288, figs. 153, 154: as *Mitrocoma cirrata*. KRAMP 1924, p. 17: as *M. cirrata*; western Mediterranean. KRAMP 1932, p. 320: demonstration of the closed vesicles. THIEL 1938*c*, p. 330, fig. 8: as *Eucheilota multicirrata* n.sp.; comparison with *M. cirrata*; S. of Accra, W. Africa; E. of Cape Verde Islands; N.W. of mouth of Amazon. KRAMP 1955*a*, p. 254: as *E. cirrata*; Canary Islands; Gulf of Guinea. VANNUCCI 1957*d*, pp. 60, 91, 98, 99, 103: Brazil. BRINCKMANN 1959*a*, pp. 82–9, figs. 1–3: as *E. cirrata*, reared from the hydroid *Haleciella microtheca* HADŽI;

Naples, Italy. KRAMP 1959*a*, pp. 153, 224, 225, 227, 232, 233, 265, fig. 203: as *Lovenella cirrata*; diagnosis; distribution. KRAMP 1959*b*, p. 8: Sierra Leone, W. Africa.

Lovenella clausa (Lovén 1836)

5–9 mm wide, hemispherical, jelly moderately thick. Stomach short and small; four small simple lips; gonads oval, longitudinally divided, very close to ring canal. 16–24 tentacles with large, conical bulbs; 1–3 lateral, spiral cirri on either side of each tentacle base; 16–23 statocysts, each with one concretion.

LOVÉN 1836, p. 261: as *Campanularia clausa* n.sp.; hydroid. HINCKS 1871, p. 79, Pl. 5, figs. 2, 2*a*, 2*b*: *Lovenella clausa*; hydroid and young medusa. RUSSELL 1936*b*, pp. 589–94, figs. 1–6: as *Eucheilota hartlaubi* n.sp; hydroid: *Lovenella clausa*; possibly =*E. maasi* Neppi & Stiasny; Plymouth. RUSSELL 1936*c*, pp. 131, 133, figs. 1–3: as *E. clausa*; Plymouth. KRAMP 1937*b*, p. 106: as *E. hartlaubi*. RUSSELL 1938*b*, pp. 412–14, 416, 418, 432: as *E. clausa*; Plymouth. RUSSELL 1938*d*, p. 157, figs. 66–74: nematocysts. REES 1939*b*, p. 442: discussion; *E. maculata* juv. Kramp 1926 ? =*E. clausa*. RUSSELL 1953, p. 307, Pl. 16, fig. 2, Pl. 18, figs. 3, 4, text-figs. 189–92: *Lovenella clausa*; South England; Ireland. VANNUCCI 1957*d*, p. 61. AURICH 1958, p. 215: frequency of occurrence in S.E. North Sea. KRAMP 1959*a*, pp. 153, 215, 218, 222, fig. 202: diagnosis; distribution.

Family *PHIALELLIDAE*

Leptomedusae with small stomach; without peduncle; with four simple radial canals; with gonads with median groove, on radial canals separated from stomach; with hollow marginal tentacles; without excretory pores; without marginal or lateral cirri; with eight closed marginal vesicles usually with two or more concretions; without ocelli. Hydroids, where known, with hydranth without webs, hydrotheca with operculum.

Genus ***Phialella*** Browne 1902

Phialellidae with the characters of the family.

Type-species: *P. falklandica* Browne.

BROWNE 1902, p. 282: *Phialella* n.g. MAYER 1910, p. 234: as synonym of *Eucope*.

Phialella annulata (von Lendenfeld 1884)

2 mm wide, 2·5 mm high, ovate. Manubrium prismatic, wide at mouth with four simple lips, narrow at base; four oval gonads along distal 1/3 of the radial canals; radial canals straight and wide; frequently one canal is forked. Eight short, thick tentacles, small bulbs; large marginal vesicles with two concretions. Doubtful species.

VON LENDENFELD 1884*a*, p. 602, Pl. 28, figs. 53–7: as *Eucope annulata* n.sp.; Lyttleton, New Zealand. MAYER 1910, p. 237: as *E. annulata*.

Phialella dissonema (Haeckel 1879)

5 mm wide, 7 mm high, pyriform; exumbrella thickly besprinkled with nematocysts. Manubrium spindle-shaped, half the length of bell cavity, four short recurved lips; gonads sac-like, along middle half of radial canals. Short, conical apical canal. Two opposite tentacles, with large, pyriform bulbs, very long; statocysts each with one concretion. Doubtful species.

HAECKEL 1879, p. 169, Pl. 11, fig. 5: as *Saphenella dissonema* n.sp.; near Hawaiian Islands, Pacific Ocean. MAYER 1910, p. 237, fig. 123: as *Eucope dissonema.*

Phialella falklandica Browne 1902

Up to 17 mm wide, semi-globular, thick walls. Stomach short, quadrangular; four lips with fimbriated margin; gonads along greater part of radial canals, hanging down in wavy folds. About 60 tentacles with large bulbs; statocysts on broad, cushion-like bulbs, with two or more concretions.

BROWNE 1902, p. 282: *Phialella falklandica* n.g., n.sp.; Falkland Islands. BENHAM 1909, p. 307, Pl. 12, figs. 3–6: as *Phialella*; Auckland and Campbell Islands, S. of New Zealand. MAYER 1910, p. 237: as *Eucope falklandica.* VANHÖFFEN 1913*b*, p. 21: Straits of Magellan; Valparaiso, Chile; Callao, Peru. BROWNE & KRAMP 1939, p. 296, Pl. 17, figs. 2–4, Pl. 19, figs. 3–5, text-fig. 1: discussion of the name; Falkland Islands. KRAMP 1957*a*, pp. 34, 96, 124: Falkland Islands; South Patagonia. KRAMP 1959*a*, pp. 152, 235, 237, 269, fig. 201: diagnosis: distribution.

Phialella fragilis (Uchida 1938)

5–6 mm wide, 9–12 mm high, dome-shaped, jelly thin and soft. Manubrium small, four well developed lips; gonads linear, sac-like, along distal 1/3 of radial canals. 16 tentacles; statocysts mounted on warts.

UCHIDA 1938*c*, p. 51, fig. 4: as *Eucope fragilis* n.sp.; Konorihama, Japan.

Phialella hyalina (von Lendenfeld 1884)

6 mm wide, watch-glass-shaped, thick at centre. Stomach half as long as bell cavity, wide; four large, oval gonads on distal 1/3 of radial canals. Eight tentacles, bulbs nearly cylindrical; large marginal vesicles, each with three concretions.

VON LENDENFELD 1884*a*, p. 920, Pl. 42, figs. 16–18: as *Eucope hyalina* n.sp; Sydney harbour, Australia. MAYER 1910, p. 237: as *E. hyalina.* KRAMP 1953, p. 311: type specimen examined; obviously belongs to *Phialella*, the species is temporarily retained.

Phialella parvigastra (Mayer 1900)

Young medusa: 1 mm high, half-egg-shaped. Manubrium very small, four simple lips; gonads swollen, linear, near middle of radial canals. Four small tentacles; marginal vesicles each with one concretion.

MAYER 1900*b*, p. 52, Pl. 42, fig. 140: as *Eucopium parvigastrum* n.sp.; Tortugas, Florida. MAYER 1910, p. 238, Pl. 31, fig. 5: as *Eucope parvigastra.* KRAMP 1959*a*, pp. 152, 231: as *Phialella parvigastra*; diagnosis; distribution.

Phialella quadrata (Forbes 1848)

13 mm wide, hemispherical, thick walls. Stomach short, quadratic, with small base; four short, slightly folded lips; gonads on distal 1/3 of radial canals, elongated oval. 16–32 tentacles with small, globular basal bulbs; no ocelli; statocysts on cushion-like swellings with 2–4 or more concretions

FORBES 1848, p. 43, Pl. 9, fig. 2: as *Thaumantias quadrata* n.sp.; British Isles. MAYER 1910, p. 235: as *Eucope globosa* (Haddon). (Coasts of Britain and Holland). INT. PLANKT. CATAL. III 1916, p. 43: as *Phialidium cymbaloideum*; England; Ireland. KRAMP 1919, p. 90: as *E. globosa*. MAR. BIOL. ASS. 1931, p. 82: as *Phialella* (*Phialidium*) *cymbaloides*; Plymouth. KRAMP 1933*a*, p. 576, figs. 40, 41: as *E. quadrata*; synonyms; distribution. RANSON 1933*c*, p. 319: as *E. globosa*; development; English Channel. KRAMP 1937*b*, p. 102, fig. 44*b*: as *E. quadrata*. MOORE 1937, p. 50: as *Phialella* (*Phialidium*) *cymbaloides*; Isle of Man. RUSSELL 1938*b*, pp. 413, 416, 418: as *Phialella cymbaloides*; Plymouth. RUSSELL 1938*d*, p. 157, figs. 52–4: as *Phialella cymbaloides*; nematocysts. REES 1939*b*, pp. 440–2: *Phialella quadrata*. KRAMP 1947, p. 52: E. of Scotland. RUSSELL 1953, p. 315, Pl. 16, figs. 4–6, Pl. 17, fig. 5, text-figs. 196–200: British coasts; p. 320: New Zealand. KRAMP 1955*a*, p. 255: Gulf of Guinea, W. Africa. KRAMP 1959*a*, pp. 152, 215, 218, 227, 271, fig. 200: diagnosis; distribution.

Phialella sp. (Menon 1932)

Young medusa: 1 mm wide, dome-shaped. Manubrium half as long as bell cavity; four prominent lips; no gonads developed. Four tentacles; four interradial only just developing; statocysts each with 1–2 concretions.

MENON 1932, p. 15, Pl. 2, fig. 17: as *Eucope* sp. Madras, India.

Phialella spp.

GEORGE 1953, p. 82: *Eucope* sp.; Calicut, southern India. GANAPATI & NAGABHUSHANAM 1958, pp. 92, 94: *Phialella* sp.; Vizagapatam coast, India.

EUCOPIDA INCERTAE SEDIS

With closed marginal vesicles.

Genus ***Blackfordia*** Mayer 1910

Eucopida with four radial canals; without gastric peduncle; with gonads completely surrounding radial canals; with numerous hollow marginal tentacles; the endodermal cores of the tentacles extend inwards from the bell margin into the gelatinous substance of the bell; with numerous closed marginal vesicles; without permanently rudimentary tentacles; without marginal or lateral cirri.

Type-species: *B. manhattensis* Mayer.

MAYER 1910, p. 276: *Blackfordia* n.g.

Blackfordia manhattensis Mayer 1910

10 mm wide, higher than a hemisphere, with rounded apex. Stomach narrow, half as long as bell cavity; four long, slender, frilled lips; gonads on middle part of radial canals, elongated, undulated. 70–80 tentacles, with finger-shaped endodermal diverticula into bell margin; 2–3 marginal vesicles between successive tentacles, each with 2–5 concretions; no black pigment at base of marginal vesicles.

MAYER 1910, p. 277, Pl. 36, fig. 2: *Blackfordia manhattensis* n.g., n.sp.; New Jersey, Atlantic coast of North America. KRAMP 1959*a*, pp. 155, 211, 213: diagnosis; distribution.

Blackfordia virginica Mayer 1910

14 mm wide, higher than a hemisphere, with rounded apex. Stomach narrow, half as long as bell cavity, four long, recurved, fluted lips; gonads linear, from corners of stomach extending along somewhat more than half the length of radial canals. About 80 long tentacles with finger-shaped or broadly oval diverticula into bell margin; one (rarely two) marginal vesicles between successive tentacles, each with 2–3 concretions. According to the original description black pigment granules are present at base of the marginal vesicles, but examination of specimens from all three localities has revealed no such pigment.

MAYER 1910, p. 277, Pl. 36, figs. 3–5, Pl. 37, fig. 6: *Blackfordia virginica* n.sp; Hampton Roads and Norfolk Harbour, Virginia, U.S.A. COWLES 1930, p. 331: as *B. virginiana*; Chesapeake Bay, U.S.A. THIEL 1935*c*, p. 169, figs. 1, 2: description and report of Valkanov. VALKANOV 1935, pp. 278, 289, Pls. 5, 6, figs. 14–16: hydroid *Campanulina*-like, *Campanulina* (?) *pontica*; Mandra swamps, Bulgarian coast of Black Sea. VALKANOV 1957, p. 16: Black Sea. KRAMP 1958*b*, p. 343, fig. 1: Ganges estuary, India. KRAMP 1959*a*, pp. 156, 211, 213, 265, 272, fig. 210: diagnosis; distribution; *B. manhattensis* possibly = *virginica*. LOGVINENCO 1959, p. 1257: Caspian Sea.

'*Dipleurosoma*' *gemmifera* Thiel 1938

2 mm high, 3 mm wide. Manubrium fairly short, branching into five lobes, each lobe giving rise to 1–3 radial canals which sometimes branch dichotomously, 13 canals reaching the ring canal, the rest ending blindly in medusa-buds. About 13 fairly short tentacles with globular bulbs; one lithocyst between every two tentacles (!).

THIEL 1938*c*, p. 324, figs. 5–7: *Dipleurosoma gemmifera* n.sp.; Fernando Po, Gulf of Guinea. KRAMP 1955*a*, p. 310: remarks. KRAMP 1959*a*, pp. 156, 227, fig. 211: systematic position doubtful.

Genus ***Eugymnanthea*** Palombi 1935

Degenerate medusae with marginal vesicles, reared from hydroid.

Type-species: *E. inequilina* Palombi.

Eugymnanthea inequilina Palombi 1935

0·55 mm high and wide; without manubrium and tentacles; four simple, unbranched radial canals; four large, sac-like, oval gonads on radial canals, not lobular; eight adradial marginal vesicles.

PALOMBI 1935, pp. 159–68, Pl. 2, figs. 1–8: *Eugymnanthea inequilina* n.g., n.sp., reared from an athecate hydroid, living in *Tapes decussatus*; Naples, Italy. CERRUTI 1941, p. 1: as *Mytilhydra polimantii* n.g., n.sp. MATTOX & CROWELL 1951, p. 162. CROWELL 1957, pp. 162–7: found in various mussels; probably = *M. polimantii* Cerruti. KRAMP 1959*a*, pp. 155, 223, 226, fig. 209: diagnosis; distribution.

Family *PHIALUCIIDAE*

Leptomedusae with small stomach; with 4–8 simple radial canals; without peduncle; with gonads completely surrounding radial canals (except in *Octocannoides*) and separated from stomach; with excretory papillae on adaxial side of marginal bulbs; without marginal or lateral cirri; with closed marginal vesicles. Hydroids unknown.

Genus ***Octocannoides*** Menon 1932

Phialuciidae with eight simple radial canals which arise separately from periphery of stomach. Eight tentacles with abaxial ocelli; ' sense clubs ' (?) on bell margin. Statocysts without ocelli. No peduncle; eight lips. Gonads consisting of two lateral halves.

Type-species: *O. ocellata* Menon.

Octocannoides ocellata Menon 1932

5–7 mm wide, flatter than a hemisphere, not thick. Eight large gonads on middle portion of radial canals, each consisting of two lateral halves. Tentacles with large, conical bulbs with conspicuous abaxial ocelli (not cordyli); in each octant about five statocysts with 2–3 concretions.

MENON 1932, p. 21, Pl. 3, figs. 27, 28: *Octocannoides ocellata* n.g., n.sp.; Madras, India. GANAPATI & NAGABHUSHANAM 1958, pp. 92, 94: Vizagapatam coast, India. KRAMP 1958*b*, p. 350, figs. 4, 5: Mergui Archipelago, Indian Ocean.

Genus ***Octophialucium*** Kramp 1955

Phialuciidae with normally eight radial canals; without ocelli.

Type-species: *O. medium* Kramp.

KRAMP 1955*a*, p. 256: *Octophialucium* n.g., erected to comprise *O. medium* Kramp, n.sp. and several species previously referred to *Octocanna.*

Octophialucium aphrodite (Bigelow 1919)

15–25 mm wide, 7–9 radial canals. Gonads spindle-shaped, along distal 1/5 – 1/2 of radial canals. Tentacles very numerous, closely crowded; well developed excretory papillae; no permanently rudimentary bulbs. Statocysts more numerous than tentacles.

MAAS 1906*a*, p. 95, Pl. 3, fig. 10: as *Octocanna polynema*; Amboina, Indonesia. BIGELOW 1919, p. 307, Pl. 42, figs. 1, 2: as *Octocanna aphrodite* nom.nov. for *O. polynema* Maas 1906; non = *O. polynema* Haeckel; Philippines. STIASNY 1928*b*, p. 212, fig. 2: as *Octocanna aphrodite*, *O. polynema* Maas 1906; Java Sea. KRAMP 1955*a*, p. 259: *Octophialucium aphrodite* n.g., remarks. KRAMP 1957*a*, pp. 35, 97, 105, 124: East Mozambique Channel.

Octophialucium bigelowi Kramp 1955

10 mm high, 8 mm wide, with very thick jelly. Mouth with eight pointed lips; gonads swollen, along almost entire length of radial canals. Eight large tentacles; 1–3 triangular bulbs between tentacles; 3–5 statocysts between tentacles.

BIGELOW 1909*a*, p. 169, Pl. 6, figs. 6, 10, Pl. 38, figs. 1–3: as *Octocanna polynema*; Acapulco Harbour, Mexico. MAYER 1910, p. 321: doubtful whether belonging to *O. polynema* Haeckel. KRAMP 1955*a*, p. 259: *Octophialucium bigelowi* nom. nov. for *O. polynema* Bigelow 1909.

Octophialucium funerarium (Quoy & Gaimard 1827)

30–40 mm wide, lens-shaped, very thick with a thin margin. Stomach very small, eight small simple lips; gonads on distal 1/4 of radial canal, near margin. 64–128 tentacles; statocysts usually two between tentacles, with 1–3 concretions.

QUOY & GAIMARD 1827, p. 184, Pl. 6, figs. 10–15: as *Dianaea funeraria* n.sp.; Straits of Gibraltar. MAAS 1910, p. 3: as *Octocanna funeraria*, rediscovered in Mediterranean Sea. MAYER 1910, p. 380: doubtful synonym of *Rhopalonema coeruleum* Haeckel. APSTEIN 1913, p. 613: as *Octocanna funeraria*; remarks on development of gonads. KRAMP 1924, p. 19, fig. 15, map: as *Octocanna funeraria*; Mediterranean. KRAMP & DAMAS 1925, p. 306, figs. 27–33: as *Octocanna funeraria*; Norway. NORDGÅRD 1927, p. 49, fig.: as *Octocanna funeraria*; Trondhjem fjord, Norway. RANSON 1930*a*, figs. 1–3: as *Octocanna funeraria*; Mediterranean. DONS 1931, pp. 24, 25, fig. 1*a*, *b*: as *Octocanna funeraria*; Trondhjem fjord, Norway. RUNNSTRÖM 1932, p. 29: as *Octocanna funeraria*; Hjeltefjord, Norway. KRAMP 1933*a*, p. 582, figs. 49, 50: as *Octocanna funeraria*; distribution. RANSON 1936*b*, p. 113: as

Octocanna funeraria; description and discussion; Baleares, Alboran Island, Monaco, Toulon, Mediterranean. Kramp 1937*b*, p. 104, fig. 46: as *Octocanna funeraria*. Kramp 1947, p. 52: as *Octocanna funeraria*; W. of Scotland. Kramp 1948*b*, p. 21: as *Octocanna funeraria*; near Straits of Gibraltar. Rees 1953*a*, p. 8: as *Octocanna funeraria*; Herdlafjord, Norway. Russell 1953, p. 337, Pl. 21, fig. 1, text-figs. 215–19: as *Octocanna funerarium*. Kramp 1955*a*, p. 260: *Octophialucium funerarium*; discussion. Nicol 1958, p. 715: as *Octocanna funeraria*; Bay of Biscay. Tambs-Lyche 1958, pp. 9, 10: Bergen, Norway. Kramp 1959*a*, pp. 36, 157, 239, 240–55, fig. 213: Bay of Biscay; Straits of Gibraltar; diagnosis; distribution.

Octophialucium indicum Kramp 1958

Up to 17 mm wide, disk-like or lenticular, thick. Stomach short 1/6 as wide as umbrella; eight pointed crenulated lips; 6–11 radial canals (usually eight) continued inwards almost to centre of stomach; gonads along distal 1/5 or less of radial canals. 19–28 tentacles with broadly conical bulbs with long excretory papillae; no abaxial exumbrellar clasps. Between tentacles 3–5 small triangular bulbs with excretory papillae; one statocyst between successive marginal bulbs.

Menon 1932, p. 23, Pl. 3, fig. 25: as *Octocanna polynema*; Madras, India. ?Nair 1951, p. 63: as *Octocanna polynema*; Trivandrum coast, India. ?George 1953, p. 82: as *Octocanna polynema*; Calicut, southern India. Chiu 1954*a*, pp. 41, 45, Pl. 4, fig. 14: as *Octocanna polynema*; Amoy, China. Chiu 1954*b*, pp. 51, 52, 55: as *Octocanna polynema*; China. ?Chow & Huang 1958, pp. 184, 189: as *Octocanna polynema*; Chefoo, China. ?Ganapati & Nagabhushanam 1958, pp. 92, 94: as *Octocanna polynema*; Vizagapatam coast, India. Kramp 1958*b*, p. 347, text-figs. 2*a*, *b*: *Octophialucium indicum* n.sp.; Akyab Harbour, Burma; Mergui Archipelago, Indian Ocean.

Octophialucium medium Kramp 1955

Diameter 17–30 mm, evenly vaulted, not lenticular, thick. Stomach 1/7 as wide as umbrella, with broad star-shaped figure; eight long and pointed, crenulated lips. Radial canals 6–11, usually eight; gonads linear along distal 2/3 – 3/4 of radial canals. 16 tentacles; between tentacles usually three young bulbs and four statocysts.

Kramp 1955*a*, p. 257, figs. 4, 5, Pl. 2, fig. 1: *Octophialucium medium* n.g., n.sp.; probably – *Octocanna polynema* Browne 1905; discussion of the genera *Octocanna* and *Octophialucium*; off Niger Delta, W. Africa. Kramp 1957*a*, pp. 34, 124: Gulf of Guinea, W. Africa. Kramp 1959*a*, pp. 157, 227, fig. 214: diagnosis; distribution.

Octophialucium solidum (Menon 1932)

About 10 mm, hemispherical, very thick. Stomach broad, eight short lips; eight radial canals; gonads along almost entire length of radial canals. Four tentacles with large bulbs with excretory papillae and exumbrellar clasps, several small ' tentacle-like structures ' without papillae or clasps, their tips dark-brown; about one statocyst between each pair of these.

MENON 1931, p. 503: as *Octocanna polynema*; Madras, India. MENON 1932, p. 22, Pl. 3, fig. 26: as *Octocanna solida* n.sp.; Madras, India. KRAMP 1955*a*, p. 259: *Octophialucium solidum.*

Octophialucium sp.

18 mm wide, with 8–9 radial canals; number of tentacles unknown.

KRAMP 1959*a*, pp. 36, 157, 232, 233: West Indies; first record of an *Octophialucium* from the western Atlantic.

Genus ***Phialucium*** Maas 1905

Phialuciidae with normally four radial canals; with permanently rudimentary tentacle bulbs and marginal bulbs with adaxial excretory papillae; without ocelli.

Type-species: *P. mbenga* (Agassiz & Mayer)

MAAS 1905, p. 32: *Phialucium*, subgenus of *Phialidium.* BIGELOW 1909*a*, p. 157: genus *Phialucium*, including *P. virens* (Bigelow 1904), =*Phialidium tenue* Browne 1905, *P. carolinae* (Mayer 1900), *P. mbenga* (Agassiz & Mayer 1899), ? =*P. virens*, and *P. comata* n.sp.; also comprising species with cirri. MAYER 1910, p. 276: *Phialucium comata* Bigelow is transferred to *Phialopsis.* VANHÖFFEN 1911*a*, p. 225: *P. mbenga*, *carolinae* and *virens* are united. BIGELOW 1919, p. 293: comparison of species; *P. virens* = *P. mbenga*, but *P. carolinae* is probably a valid species; does not admit that *Phialidium tenue* Browne is an abnormal *Irenopsis.* KRAMP 1953, pp. 273–5: discussion and historical review; *P. virens* synonym of both *P. carolinae* and *P. mbenga*; *Phialidium tenue* Browne does not belong to *Phialucium.* CHOW & HUANG 1958, pp. 180, 190: revision of species.

Phialucium carolinae (Mayer 1900)

14–20 mm wide, not quite hemispherical, jelly fairly thick. Stomach flask-shaped, simple lips, usually four but sometimes up to eight radial canals; gonads linear, along distal half of radial canals. 16–36 well developed tentacles; between successive tentacles usually three rudimentary bulbs, the middle one the largest, and four marginal vesicles, each with two concretions.

MAYER 1900*a*, p. 7, Pl. 3, fig. 9, Pl. 4, figs. 10, 11: as *Oceania carolinae* n.sp.; Charleston Harbour, Carolina, U.S.A. MAAS 1905, p. 38: *Phialucium carolinae.* BIGELOW 1909*a*, p. 157: remarks. MAYER 1910, p. 275, Pl. 36, figs. 1′, 1″: Tortugas, Florida. VANHÖFFEN 1911*a*, p. 225, Pl. 22, fig. 11, text-fig. 15: as *Phialidium heptactis* n.sp. from Nias Island, west of Sumatra; *P. carolinae* probably a starved form of *P. mbenga.* VANHÖFFEN 1912, p. 19: as *Phialidium phosphoricum* f. *polynema*; Amoy, China. BIGELOW 1919, pp. 293, 294: discussion; p. 295, Pl. 41, fig. 8: as *P. mbenga*; p. 296: as *P. mbenga* var. *polynema*; Philippines. ?STIASNY 1928*b*, p. 208: as *P. mbenga*; Java Sea; Singapore. BURKENROAD 1931, pp. 115–18, fig. 1: as *Pseudoclytia longleyi* n.sp.; p. 118: as *P. carolinae*; Tortugas, Florida. UCHIDA 1947*a*, p. 307: Palao Islands, Pacific Ocean. NAIR 1951, p. 62: as *P. mbenga*; Trivandrum coast, India. ?Bal & Pradhan 1952, p. 76: as *P. virens*; Bombay, India. Kramp 1953, p. 276, figs. 2, 3: variation and synonyms; Great Barrier Reef, Australia. Kramp 1955*a*, pp. 260, 261: *Octocanna polynema* Menon 1932 and Browne 1905 non = *P. carolinae*. Vannucci 1957*d*, p. 102. Chow & Huang 1958, pp. 179, 189, Pl. 3, figs. 22, 23: Chefoo, China. Kramp 1958*b*, p. 346: Nicobars, Indian Ocean. Kramp 1959*a*, pp. 156, 231, 270, fig. 212: diagnosis; distribution.

Phialucium condensum Kramp 1953

Diameter 6–7 mm. Similar to *P. carolinae*, but gonads very near the corners of the stomach, 1/4 to 1/3 of the length of radial canals.

Kramp 1953, p. 279, Pl. 1, fig. 4, text-fig. 4: *Phialucium condensum* n.sp.; Great Barrier Reef, Australia. Chow & Huang 1958, p. 190.

Phialucium mbenga (Agassiz & Mayer 1899)

9–12 mm wide, flatter than a hemisphere. Stomach urn-shaped, wider than long; gonads linear, swollen, along distal half of radial canals. 16 tentacles and about 80 rudiments, all alike; 32 statocysts with 5–9 concretions.

Agassiz & Mayer 1899, p. 168, Pl. 8, figs. 24, 25: as *Mitrocoma mbenga* n.sp.; Fiji Islands, Pacific Ocean. Bigelow 1904, p. 252, Pl. 1, figs. 3, 4: as *Oceania virens* n.sp.; Maldive Islands. Maas 1905, p. 32, Pl. 6, figs. 36, 37: as *Phialucium virens* n.g.; Malayan Archipelago. Hartlaub 1909*b*, p. 456: ? = *P. virens* (Bigelow), probably an abnormal *Irenopsis hexanemalis*. Maas 1909, p. 23: *Phialucium* has probably no cirri. Mayer 1910, p. 276: *P. mbengha*. Vanhöffen 1911*a*, p. 225, Pl. 22, fig. 12, text-fig. 16: North Sumatra. Bigelow 1919, p. 295: discussion of species. ?Stiasny 1928*b*, p. 208: Java Sea; Singapore. ?Nair 1951, p. 62: Trivandrum coast, India. Kramp 1953, p. 275, fig. 1: synonyms; Great Barrier Reef, Australia. Vannucci 1957*d*, p. 102. Chow & Huang 1958, p. 190. Kramp 1958*b*, p. 345: Nicobars, Indian Ocean.

Phialucium multitentaculatum Menon 1932

11 mm high, 14 mm wide, very thick. Stomach rectangular, small, with four fimbriated lips, rather long. Four radial canals, ribbon-like and folded in adult; gonads along almost entire length of the radial canals. 25–32 tentacles, 3–4 rudiments between tentacles; about 150 statocysts, with 2(–4) concretions.

Menon 1932, p. 16, Pl. 2, figs. 15, 16: *Phialucium multitentaculata* n.sp.; Madras, India.

Phialucium taeniogonia Chow & Huang 1958

Up to 15 mm wide, higher than a hemisphere, jelly thick, thinning towards margin. Stomach quadrate, mouth tube very short, four simple lips; four narrow radial canals; gonads slightly twisted wide ribbons near umbrella margin. Generally eight or more marginal tentacles, at somewhat irregular distances from each other, with globular or broadly conical bulbs; between successive tentacles 3–8 small rudimentary bulbs, the median one larger than the others; statocysts alternating with tentacles and rudimentary bulbs.

Chow & Huang 1958, pp. 180, 190, Pl. 3, figs. 24–6: *P. taeniogonia* n.sp.; Chefoo, China.

Family *EIRENIDAE*

Leptomedusae with small stomach; with a gastric peduncle; with four or six simple radial canals; with gonads on radial canals restricted to subumbrella; with hollow marginal tentacles; with or without excretory pores; with or without lateral or marginal cirri; with a large and indefinite number of closed marginal vesicles; without ocelli. Hydroids, where known, hydranth with webs between tentacles, hydrotheca with operculum.

Genus ***Eirene*** Eschscholtz 1829

Eirenidae with a distinct peduncle; without lateral or marginal cirri.

Type species: *E. viridula* (Péron & Lesueur).

Eschscholtz 1829, p. 94: *Eirene* n.g. McCrady 1857, p. 193: as *Phortis* n.g. Haeckel 1879, p. 200: as *Irene.*

Eirene brevigona Kramp 1959

6 mm wide, peduncle slender, hardly as long as bell radius. Mouth large, with four short lips. Gonads short and oval, in middle portion of radial canals. 24 tentacles and seven young bulbs, no excretory papillae; one marginal vesicle between successive tentacles.

Kramp 1959*c*, p. 255, fig. 18: *E. brevigona* n.sp; east coast of Malaya.

Eirene ceylonensis Browne 1905

15–25 mm wide. Peduncle long, narrow, cylindrical. Gonads extending from base of peduncle to near the bell margin. 100 or more tentacles, short, with excretory pores. No or very few young bulbs. About 100 lithocysts.

Browne 1905*b*, p. 140, Pl. 3, figs. 9–11: as *Irene ceylonensis* n.sp.; Ceylon. Bigelow 1909*a*, pp. 160, 161, 164: *Eirene ceylonensis.* Mayer 1910, p. 309: as *Phortis ceylonensis.* Bigelow 1919, p. 304: as *P. ceylonensis*; distribution; Philippines. Stiasny 1928*b*, p. 209: as *P. ceylonensis*; Java Sea. Kramp 1936*b*, p. 249: *E. ceylonensis*; bibliography. Lele & Gae 1935, p. 92, text-figs.: as *P. ceylonensis*; Bombay. Rees 1939, p. 443: discussion of hydroid. Nair 1951, p. 64: as *E. ceylonensis* ‘ bigger type ’; Trivandrum coast, India. Bal & Pradhan 1952, p. 76: as *Phortis ceylonensis*; Bombay, India. Kramp 1953, p. 285: Great Barrier Reef, Australia. Chiu 1954*a*, pp. 41, 44, Pl. 1, figs. 3, 4: as *Phortis ceylonensis*; Amoy, China. Chiu

1954*b*, pp. 51, 52, 53: as *Phortis ceylonensis*; China. CHOW & HUANG 1958, pp. 181, 189, Pl. 3, figs. 27, 28: Chefoo, China. GANAPATI & NAGABHUSHANAM 1958, pp. 92, 93: Vizagapatam coast, India. KRAMP 1958*b*, p. 352: Nicobars; Mergui Archipelago; Akyab Harbour, Burma; Vizagapatam, Indian Ocean.

Eirene elliceana (Agassiz & Mayer 1902)

About 16 mm wide. Peduncle about as long as bell diameter, slender, with broad, pyramidal base. About 56 tentacle bulbs: four large perradial, 12 of medium size (three in each quadrant) and 40 very small, rudimentary bulbs. About 56 lithocysts.

AGASSIZ & MAYER 1902, p. 146, Pl. 2, figs. 5–7: as *Phortis elliceana* n.sp.; Ellis Islands, tropical Pacific. MAYER 1910, p. 309, fig. 170: as *P. elliceana*. BIGELOW 1919, p. 305, Pl. 41, figs. 3–7: as *P. elliceana*; Philippines. KRAMP 1936*b*, p. 249: *Eirene elliceana*; bibliography.

Eirene gibbosa (McCrady 1857) non Eschscholtz

About 25 mm wide, somewhat higher than wide. Peduncle wide and not very long; stomach quite large; gonads linear, along distal portions of radial canals. About 60 long, slender tentacles with large basal bulbs; about 60 marginal vesicles, each with one concretion.

MCCRADY 1857, p. 193: as *Phortis gibbosa* n.sp.; Charleston Harbour, New England, U.S.A. L. AGASSIZ 1862, p. 362: as *Eirene gibbosa*. MAYER 1910, p. 307: as *P. gibbosa*; (New England; North Carolina). BIGELOW 1919, p. 302: comparison with *E. pyramidalis*. KRAMP 1936*b*, p. 247: bibliography. KRAMP 1959*a*, pp. 159, 231, 233: diagnosis; distribution.

Eirene hexanemalis (Goette 1886)

Up to 18 mm wide. Peduncle thick, conical, stomach very small; gonads along less than the distal half of the normally six radial canals. 30–50 short, slender, tapering tentacles with large, swollen bulbs, with excretory papillae; three or more rudimentary bulbs and about four lithocysts between every two tentacles.

GOETTE 1886, p. 832: as *Irenopsis hexanemalis* n.g., n.sp.; Zanzibar, E. Africa. MAYER 1910, p. 310, fig. 171: as *I. hexanemalis*. (Tropical parts of Indian Ocean; Malayan Archipelago). *Phialidium tenue* Browne 1905*a* from Maldive Islands is erroneously considered = *I. hexanemalis*. VANHÖFFEN 1911*a*, p. 229, fig. 19: as *I. hexanemalis*; Nicobars. VANHÖFFEN 1913*b*, p. 17: as *Phortis pellucida* forma *hexanemalis* and *pentanemalis*; Hong Kong. STIASNY 1928*b*, p. 211: as *I. hexanemalis*; Singapore; Java Sea. MENON 1932, p. 19: as *I. hexanemalis*; Madras, India. RANSON 1933*a*, p. 19: as *Phortis ?pellucida*. RANSON 1934*a*, pp. 75, 76: as *Phortis hexanemalis*, = *Phialidium tenue* Browne 1905*a*; non = *Phialucium mbenga*. KRAMP 1936*b*, p. 248: *Eirene hexanemalis*; bibliography. UCHIDA 1938*a*, p. 146: as *I. hexanemalis*; Hakota Bay, Japan. NAIR 1951, p. 63: Trivandrum coast, India. KRAMP 1953, p. 281, fig. 5: variation; Great Barrier Reef, Australia. CHIU 1954*a*, pp. 41, 44, Pl. 3, figs. 9–12: as *Irenopsis hexanemalis*. CHIU 1954*b*, pp. 51, 52, 55: as *Irenopsis hexa-*

nemalis; China. Chow & Huang 1958, pp. 183, 189: Chefoo, China. Ganapati & Nagabhushanam 1958, pp. 92, 94: Vizagapatam coast, India. Kramp 1958*b*, p. 354: Mergui Archipelago; Nicobars. Yamazi 1958, p. 136: as *Irenopsis hexanemalis*; Tanabe Bay, Japan.

Eirene kambara Agassiz & Mayer 1899

8 mm wide; peduncle distinct, short and broad. Gonads on distal portions of radial canals, short and oval. 16–32 very small, slender tentacles; 64 lithocysts.

Agassiz & Mayer 1899, p. 169, Pl. 8, fig. 29: *Eirene kambara* n.sp.; Fiji Islands, Pacific Ocean. Bigelow 1909*a*, p. 161: identical with *E. ceylonensis* juv.? Mayer 1910, p. 309: as *Phortis kambara.* Bigelow 1919, p. 303: as *P. kambara*, ? = *E. ceylonensis* juv. Kramp 1936*b*, p. 248: bibliography. Kramp 1953, p. 283, Pl. 2, fig. 5, text-fig. 6: Great Barrier Reef, Australia.

Eirene lactea (Mayer 1900)

5 mm wide, higher than a hemisphere, middle portion fairly thick. Peduncle slender with wide base; stomach small, cruciform, four simple, recurved lips fairly short; gonads linear, extending from near base of peduncle to near bell margin. 18–22 short tentacles with large, swollen bulbs; excretory papillae?; marginal vesicles slightly more numerous than tentacles, each with one concretion.

Mayer 1900*b*, p. 58, Pl. 40, fig. 133: as *Phortis lactea* n.sp.; Florida. Bigelow 1909*a*, p. 160: *Eirene lactea.* Mayer 1910, p. 308, Pl. 40, fig. 2, Pl. 41, fig. 6: as *P. lactea.* Bigelow 1919, p. 303: *P. lactea* may be a young *P. pyramidalis.* Kramp 1936*b*, p. 247: *Eirene lactea*; bibliography. Kramp 1953, p. 286: non = *P. lactea* Ling 1937. Kramp 1959*a*, pp. 159, 231, fig. 216: diagnosis; distribution.

Eirene menoni Kramp 1953

7–12 mm wide. Peduncle not particularly broad at the base, narrows towards the tip. Four prominent lips with folded margin. Gonads highly variable in length. About 48 tentacles, no excretory papillae. One, sometimes 2–3, statocysts between tentacles, with one concretion.

Annandale 1907, p. 79, Pl. 2, fig. 5: as *Irene ceylonensis*; Ganges estuary. Menon 1931, p. 503: as *Phortis* sp.; preliminary notice; Madras, India. Menon 1932, p. 18: as *Phortis* sp.; comparison with *P. ceylonensis* and *kambara*; Madras, India. Kramp 1936*b*, p. 251: as *Phortis* sp. Ling 1937, p. 357, figs. 9, 10: as *P. lactea*; Chekiang coast, China. Nair 1951, p. 64: as ‘ smaller type ’ of *E. ceylonensis*; Trivandrum coast, India. Kramp 1953, p. 286, Pl. 2, fig. 6: *Eirene menoni* n.sp.; Great Barrier Reef, Australia. ?Chiu 1954*b*, pp. 51, 52: as *Phortis lactea*; China. Kramp 1958*b*, p. 353: Orissa coast, India; near Calcutta.

Eirene mollis Torrey 1909

15–20 mm wide. Peduncle very short, conical. 150–180 closely set tentacles, all alike; lithocysts even more numerous.

TORREY 1909, p. 26, fig. 11: *Irene mollis* n.sp.; San Diego, California. MAYER 1910, p. 311: synonym of *Eirene viridula*. FOERSTER 1923, p. 262: *Eirene mollis* is a valid species. KRAMP 1936*b*, p. 250: bibliography.

Eirene palkensis Browne 1905

Up to 20 mm wide; peduncle long, narrow, cylindrical. Gonads extending from base of peduncle to near margin. About 50 short tentacles and about three times as many rudimentary bulbs, three between each successive pair of tentacles, the middle one a little larger than the others; tentacle bulbs and rudiments with conspicuous excretory papillae.

BROWNE 1905*b*, p. 141, Pl. 3, figs. 12–16: *Irene palkensis* n.sp.; Ceylon. BIGELOW 1909*a*, pp. 160, 161, 164: *Eirene palkensis*, probably = *E. danduensis* Bigelow. MAYER 1910, p. 309: as *Phortis palkensis*. VANHÖFFEN 1911*a*, p. 230: *I. palkensis*; Nicobars, Indian Ocean. VANHÖFFEN 1912, p. 371: as *P. palkensis*; Port Natal (Durban), South Africa. VANHÖFFEN 1913*b*, p. 18: as *P. palkensis*, non = *E. danduensis* Bigelow; Amoy; Hong Kong; Colombo, Ceylon. BIGELOW 1919, p. 302: as *P. palkensis*. KRAMP 1936*b*, p. 250: *Eirene palkensis*; bibliography. KRAMP 1953, p. 283: Great Barrier Reef, Australia. CHIU 1954*b*, pp. 51, 52: as *Phortis palkensis*. KRAMP 1958*b*, p. 352: Mergui Archipelago, Indian Ocean.

Eirene pyramidalis (L. Agassiz 1862)

35 mm wide, flatter than a hemisphere, jelly very thick. Peduncle very wide, cone-shaped; stomach very small, with small crenulated lips; gonads linear, along distal portions of radial canals near margin. About 100 small, slender tentacles, with excretory pores; about 100 marginal vesicles, each with one concretion.

L. AGASSIZ 1862, p. 363: as *Eutima pyramidalis* n.sp.; Florida. BIGELOW 1909*a*, p. 160: *Eirene pyramidalis*. MAYER 1910, p. 308, Pl. 39, figs. 3–6: as *Phortis pyramidalis*; Bahamas; Tortugas, Florida. VANHÖFFEN 1913*a*, p. 424: as *P. pyramidalis*; Tortugas, Florida. BIGELOW 1919, p. 302: as *P. pyramidalis*; comparison with *E. gibbosa*. KRAMP 1936*b*, p. 247: *E. pyramidalis*; bibliography. ?GANAPATI & NAGABHUSHANAM 1958, pp. 92, 94: Vizagapatam coast, India. KRAMP 1959*a*, pp. 159, 232, fig. 217: diagnosis; distribution. SUAREZ-CAABRO 1959, p. 27: Cuba, Caribbean Sea.

Eirene tenuis (Browne 1905)

10–15 mm wide. Peduncle short and broad; gonads nearer to margin than to the peduncle. 25–32 tentacles, bulbs long, broad with a small excretory papilla. Between tentacles 1–3 small, rudimentary bulbs and 2–4 statocysts.

BROWNE 1905*a*, p. 730, Pl. 54, fig. 4, Pl. 57, fig. 16: as *Phialidium tenue* n.sp.; Maldive Islands, Indian Ocean. BROWNE 1905*b*, p. 142: *P. tenue* is considered as an abnormal specimen of *Irenopsis hexanemalis*. MAYER 1910, p. 310: synonym of *I. hexanemalis*. RANSON 1934*b*, p. 182: *Phialidium tenue* - *Phortis pellucida*, non *hexanemalis*. KRAMP 1953, pp. 273–5: does not belong to *Phialucium* (as stated by Maas 1905). KRAMP 1958*b*, p. 351: *E. tenuis* a valid species, referred to genus *Eirene*; Nicobar Islands, Indian Ocean.

Eirene viridula (Péron & Lesueur 1809)

20–30 mm wide, umbrella hemispherical, middle portion fairly thick. Peduncle slender, with pyramidal base; stomach fairly small but with four long, pointed lips with crenulated margins; gonads linear, extending from somewhat beyond base of peduncle almost to bell margin. About 60 or more tentacles of different sizes, large and small frequently alternating; bulbs conical, with distinct adaxial excretory papillae; 40 or more marginal vesicles, each with 1–4 concretions.

Péron & Lesueur 1809, p. 346: as *Oceania viridula* n.sp.; English Channel. Eschscholtz 1829, p. 94: *Eirene viridula* n.g. Will 1844, p. 70, Pl. 2, figs. 8–12: as *Geryonia pellucida*; Trieste. Mayer 1910, p. 314: as *Tima lucullana* in part; p. 496: as *E. pellucida*. Neppi 1910, p. 157, figs. 1, 1*a*: as *Irene pellucida*; Trieste, Adriatic Sea. Stiasny 1910, p. 586: as *I. pellucida*; Trieste. Vanhöffen 1911*a*, p. 230, fig. 20: as *I. pellucida*; W. Africa. Neppi & Stiasny 1913*b*, p. 71: as *Phortis pellucida*; Trieste. Neppi 1918*a*, pp. 3, 4: as *Tima (Geryonia) pellucida*. Bigelow 1919, p. 302: as *P. pellucida*. Ranson 1926, p. 298: as *P. gibbosa*; Tatihou, Channel. Kramp 1927, p. 139: *E. viridula* in part; Denmark. Kramp 1930, p. 30: S.W. North Sea. Mar. Biol. Ass. 1931, p. 83: as *E. pellucida*; Plymouth. Kramp 1933*a*, p. 590: *E. viridula* in part. Ranson 1933*a*, pp. 1–19, figs. 1, 2: as *P. pellucida*; Djibouti, Indian Ocean. Künne 1934, p. 30, fig. 2*a–c*: S.E. North Sea. Kramp 1936*b*, p. 244: *E. viridula*; synonyms; pp. 245, 246: as *E. pellucida*; synonyms; *E. viridula* ? =*pellucida*. Kramp 1937*b*, p. 111, fig. 50: Denmark. Russell 1938*b*, pp. 413, 416, 419, 420, 437: Plymouth. Babnik 1948, p. 34, fig. 7: Adriatic Sea. Fraser & Saville 1949*b*, p. 61: Scottish waters. Ranson 1949, p. 126: as *E. pellucida*; Senegal, W. Africa. Künne 1952, pp. 12, 32: S.E. North Sea. Russell 1953, p. 321, Pl. 20, figs. 3, 4, text-figs. 201–5: *E. pellucida* = *viridula*; British coasts. Kramp 1955*a*, p. 262: certifies that *E. pellucida* = *viridula*; from Cape Palmas to Congo, W. Africa. Kramp 1958*a*, pp. 122, 127: Villefranche, Mediterranean. Kramp 1959*a*, pp. 158, 215, 218, 219, 223, 227, 271, fig. 215: diagnosis; distribution. Kramp 1959*b*, p. 8: West Africa.

Genus ***Helgicirrha*** Hartlaub 1909

Eirenidae with a distinct stomachal peduncle; with lateral cirri at the base of some or all of the tentacle bulbs; with excretory pores.

Type-species: *H. schulzei* Hartlaub.

Hartlaub 1909*a*, p. 86: *Helgicirrha* n.g. Künne 1934, p. 27. Kramp 1936*b*, p. 253: discussion of species.

Helgicirrha cari (Haeckel 1864)

25–50 mm wide, rather flat, jelly thin. Peduncle narrow, short, half as long as radius of umbrella; stomach small, lips long, lanceolate, with crumpled margins; gonads linear, narrow, extending from near base of peduncle to near bell margin. 50–60 short tentacles without lateral cirri; about 100 smaller tentacles, each with one pair of lateral cirri; about 100 marginal vesicles, each with 2–4 concretions.

Haeckel 1864, p. 332: as *Tima cari* n.sp.; Nice, France. Mayer 1910, p. 311, fig. 172: as *Eirene viridula*; Naples, Italy. Kramp 1924, p. 20: as *E. viridula* in part; Cadiz Bay, Spain. Ranson 1925*b*, p. 381: as *E. viridula*; off Portugal; Tunis. Ranson 1934*c*, p. 279: as *E. viridula*. Kramp 1936*b*, p. 253: *Helgicirrha cari*; bibliography. Kramp 1959*a*, pp. 160, 222, 223, 225, 226, fig. 219: diagnosis; distribution.

Helgicirrha danduensis (Bigelow 1904)

Up to 25 mm wide. Peduncle long and conical, stomach very elongated. Spindle-shaped gonads along distal 2/3 of radial canals. 32 tentacles, the perradial a little longer, with lateral cirri; about 70 rudimentary bulbs without cirri; 32 statocysts.

Bigelow 1904, p. 254, Pl. 1, fig. 5, Pl. 2, fig. 6: as *Eirene danduensis* n.sp.; Maldive Islands, Indian Ocean. Mayer 1910, p. 313: as *E. danduensis*. Kramp 1936*b* p. 255: *Helgicirrha danduensis*; bibliography. Kramp 1953, p. 286: probably a valid species. Kramp 1959*c*, p. 255: Nicobar Islands.

Helgicirrha malayensis (Stiasny 1928)

About 20 mm wide, jelly thin. Peduncle conical, about half as long as broad, stomach short. Gonads as a rule long, extending from margin inwards, sometimes continuing along upper part of peduncle. 30–141 tentacles, with fairly thick, conical bulbs, with lateral cirri; rudimentary tentacles without cirri, varying number. About 1–2 statocysts between every two tentacles.

Stiasny 1928*b*, p. 210, fig. 1: as *Eirene malayensis* n.sp.; Samarang, Java Sea. Menon 1932, p. 20, Pl. 3, fig. 23: as *E. malayensis*; comparison with *Phortis ceylonensis* and *palkensis*; Madras; Pl. 3, fig. 24: as *E. madrasensis* n.sp.; Madras. Kramp 1936*b*, p. 255: *Helgicirrha malayensis*; p. 256: as *H. madrasensis*. Nair 1951, p. 64: *H. malayensis*; p. 65: as *H. madrasensis*; Trivandrum coast, India. Kramp 1953, pp. 286, 287: *H. madrasensis*–*malayensis*; variation; Great Barrier Reef, Australia. Chow & Huang 1958, pp. 183, 189, Pl. 3, figs. 29, 30: Chefoo, China. Ganapati & Nagabhushanam 1958, pp. 92, 94: Vizagapatam coast, India. Kramp 1958*b*, p. 355: Mergui Archipelago and Nicobars, Indian Ocean.

Helgicirrha medusifera (Bigelow 1909)

Up to 8 mm wide. Peduncle conical. Gonads along distal 1/3 of radial canals, not quite reaching margin; clusters of medusa-buds on gonads. About 21 tentacles with swollen, conical bases; also a few marginal knobs, probably young tentacles; all with one or two pairs of lateral cirri. Statocysts alternating with tentacles.

Bigelow 1909*a*, p. 161, Pl. 37, figs. 1–8: as *Eirene medusifera* n.sp.; Pacific coast of Mexico. Mayer 1910, p. 313: as *E. medusifera*. Foerster 1923, p. 262: as *E. medusifera*. Kramp 1936*b*, p. 255: *Helgicirrha medusifera*; bibliography.

Helgicirrha schulzei Hartlaub 1909

30–40 mm wide, flatter than a hemisphere, jelly fairly thin. Peduncle narrow, elongated conical; stomach small, mouth with four very short, slightly folded lips; gonads linear, extending from near base of peduncle almost to bell margin. 30–40 large tentacles with elongated conical basal bulbs with or without lateral cirri; up to 100 or more small tentacles or rudimentary bulbs each with one pair of lateral cirri; 50 or more marginal vesicles, each with 1–4 concretions.

SCHULZE 1874, p. 138, Pl. 2, figs. 6*a*, *b*: as *Tima pellucida*; Heligoland, North Sea. HARTLAUB 1909*a*, p. 86 note: *Helgicirrha schulzii* n.g., n.sp. NEPPI 1910, pp. 157, 166, figs. 2, 2*a*, *b*: as *T. plana* and *H. plana*; Trieste. STIASNY 1910, p. 586: as *T. plana*. NEPPI 1912, p. 729: as *Eirene* (*Irene*) *plana*; Dalmatia, Adriatic Sea. APSTEIN 1913, p. 611: *H. schulzii*. NEPPI & STIASNY 1913*b*, p. 73: as *E. plana*; p. 52: as *H. schulzii*, probably = *E. plana*; Trieste. NEPPI 1918, pp. 3, 4: as *Irene plana*. NEPPI 1919, p. 121: as *E. plana*; abnormal specimen; Naples, Italy. KRAMP 1924, p. 20: as *E. viridula* in part; Straits of Gibraltar; Tunis. KRAMP 1927, p. 139: as *E. viridula* in part; W. coast of Jutland. KRAMP 1933*a*, p. 590: as *E. viridula* in part. RANSON 1934*c*, pp. 271 ff.: as *E. viridula* in part. KÜNNE 1934, p. 28, fig. 1*a–c*: *H. schulzii*; S.E. North Sea. KRAMP 1936*b*, p. 254: *H. schulzei*; bibliography. KRAMP 1937*b*, p. 113, fig. 51: Denmark. RUSSELL 1938*b*, pp. 412, 413, 414, 416, 419, 432, 437: Plymouth. RUSSELL 1938*d*, p. 159, figs. 75–80: nematocysts. BABNIK 1948, p. 37, fig. 8: Adriatic Sea. RUSSELL 1953, p. 328, Pl. 20, figs. 1, 2, text-figs. 206–12: synonyms; Plymouth; Valencia, Ireland. HURE 1955, p. 6: Adriatic Sea. ALVARIÑO 1957*b*, p. 25: Portugal. KRAMP 1959*a*, pp. 159, 215, 218, 219, 223, fig. 218: diagnosis; distribution. KRAMP 1959*b*, p. 9: off Congo, W. Africa.

Genus ***Phialopsis*** Torrey 1909

Eirenidae with four radial canals; without excretory pores; with marginal cirri; gastric peduncle feebly developed.

Type-species: *P. diegensis* Torrey.

Phialopsis diegensis Torrey 1909

20–30 mm wide, 3–4 times as wide as high, jelly moderately thick in middle portion. Peduncle very short, conical; stomach very short, mouth with very short, crenulated lips; gonads linear, extending from base of peduncle almost to bell margin. 16–28 tentacles with elongated conical bulbs; between successive tentacles 3–9 triangular rudimentary bulbs, 3–9 scattered marginal cirri, and 2–5 marginal vesicles, each with 2–6 concretions; no lateral cirri.

TORREY 1909, p. 23, fig. 9: *Phialopsis diegensis* n.g., n.sp.; San Diego, California. MAYER 1910, p. 495. VANHÖFFEN 1911*a*, p. 226, fig. 17: Gulf of Guinea, W. Africa. VANHÖFFEN 1912, p. 370: as *Irene viridula*; eastern tropical Pacific. FOERSTER 1923, p. 261. RANSON 1934*c*, pp. 275–9: as *Eirene diegensis*, probably = *Irene viridula* Maas 1893 from Irminger Sea, *E. viridula* BIGELOW 1909, S.W. of Galapagos Islands and *I. viridula* Vanhöffen 1912 from tropical Pacific. RUSSELL 1940*b*, p. 528, figs. 2*a*, *b*, 3*a–g*; description; S.W. of Ireland. KRAMP 1948*b*, p. 21: E. of Newfoundland Bank. RUSSELL 1953, p. 333, Pl. 20, fig. 5, text-figs. 213, 214. KRAMP 1957*a*, pp. 35, 125, text-fig. 7, map: S.W. of Cape Verde Islands; Gulf of Guinea; W. and S.W. of Cape of Good Hope; S.E. of S. Africa; Indian Ocean off Somaliland; off Uruguay. KRAMP 1959*a*, pp. 37, 160, 215, 216, 224, 227, 228, 232, 234, 242, 243, 249, 251, 270, fig. 220: off west coast of Africa; diagnosis; distribution.

Family *EUTIMIDAE*

Leptomedusae with small stomach; with distinct peduncle; with four simple radial canals; with gonads on radial canals separated from stomach either on peduncle or subumbrella only, or on both; with hollow marginal tentacles; without excretory pores; without marginal cirri; with or without lateral cirri; with closed marginal vesicles, usually eight; without ocelli. Hydroids, where known, *Campanopsis*-like.

Genus ***Eutima*** McCrady 1857

Eutimidae with eight (rarely 12) marginal vesicles; with lateral cirri and with marginal warts; with 2–32 tentacles.

Type-species: *E. mira* McCrady.

Subgenus ***Eutima*** McCrady 1857

With marginal swellings without adaxial papillae.

Subgenus ***Octorchis*** Haeckel 1879

With marginal swellings with adaxial papillae.

MCCRADY 1857, p. 189: *Eutima* n.g. MAYER 1910, p. 295: *Eutima*, incl. *Eutimeta, Eutimalphes, Octorchis* and *Octorchandra* Haeckel 1879. VANHÖFFEN 1913*b*, p. 21. BIGELOW 1919, p. 296: *Eutima*, incl. *Octorchis*; discussion of species. KRAMP 1933*a*, p. 587: *Eutima*, incl. *Octorchis*. RANSON 1934*a*, p. 75: *Saphenia* = *Eutima*. RANSON 1934*b*, p. 177: new definition of *Eutima*, including *Octorchis* and *Eutimalphes pretiosa*. RUSSELL 1953, p. 359: the genus is divided into *Eutima* and *Octorchis*, with new definition of *Octorchis*.

Eutima coerulea (L. Agassiz 1862)

10 mm wide, a little broader than high, jelly thick at apex. Peduncle half as long as bell diameter, slender, tapering; stomach short; four slightly fimbriated lips; four gonads extending from near stomach along peduncle and some way out on subumbrella. About 32 tentacles with lateral cirri; about 96 marginal warts with cirri; eight marginal vesicles, each with 3–5 concretions.

L. AGASSIZ 1862, p. 362: as *Eirene coerulea* n.sp.; Bahamas. MAYER 1900*b*, p. 57, Pl. 11, figs. 22, 22*a*: as *Eutimalphes coerulea*; Florida. MAYER 1910, p. 304, Pl. 41, figs. 4, 5: *Eutima coerulea*. VANNUCCI 1957*d*, pp. 65, 66. KRAMP 1959*a*, pp. 162, 231, fig. 225: diagnosis; distribution.

Eutima cuculata Brooks 1883

8 mm wide, umbrella flat, thick in centre. Peduncle about as long as diameter of umbrella; four gonads, from base of peduncle to bell margin. Four tentacles, without lateral cirri; 9–10 very small marginal cirri in each quadrant; eight marginal vesicles, each with 3–8 concretions. Doubtful species.

BROOKS, 1883, p. 140: *Eutima cuculata* n.sp.; North Carolina, U.S.A. MAYER 1910, p. 298. VANNUCCI 1957*d*, pp. 65, 66. KRAMP 1959*a*, pp. 162, 231, 233: diagnosis; systematic position doubtful.

Eutima curva Browne 1905

10 mm wide, jelly quite thick. Peduncle about as long as bell diameter, pyramidal above, prismatic below; four gonads on prismatic portion of peduncle only. Four tentacles with lateral cirri; tentacle bulbs curve upwards over margin of bell, with black pigment: 120–140 marginal warts with cirri.

BROWNE 1905*b*, p. 138, Pl. 3, figs. 1–3: *Eutima curva* n.sp.; Ceylon. MAYER 1910, p. 300. MAYER 1915*a*, p. 201, Pl. 3, fig. 5: as *E. australis* n.sp.; Torres Strait, Australia. KRAMP 1953, pp. 288, 311: *E. australis* Mayer 1915 = *E. curva*; N.E. Australia. VANNUCCI 1957*d*, p. 66.

Eutima (Octorchis) gegenbauri (Haeckel 1864)

20 mm wide, nearly hemispherical, apical jelly thick. Peduncle very long, narrow, prismatic with rather broad base; stomach short, four very short lips; four short gonads on middle portion of peduncle or nearer to stomach (in young specimens), four gonads on subumbrella only, extending from base of peduncle nearly to bell margin. 8–16 tentacles and 60–80 marginal warts with adaxial papillae; tentacle bulbs and warts each with one or two lateral cirri; eight marginal vesicles, each with 6–12 or more concretions.

HAECKEL 1864, p. 331: *Octorchis gegenbauri* n.g., n.sp.; near Nice, Mediterranean. HAECKEL 1879, p. 197, Pl. 13, fig. 2: as *Octorchis campanulatus*; Canary Islands. MAYER 1910, p. 302, figs. 166, 167: as *Eutima campanulata*; (N.W. Europe; Mediterranean; Gulf of Manaar, Ceylon?). HADŽI 1911*c*, p. 202, text-figs. 48–9: as *Campanopsis*; Adriatic Sea. NEPPI 1912, p. 729: as *O. gegenbauri*; Dalmatia, Adriatic Sea. APSTEIN 1913, p. 582, Pls. 42, 43: as *O. gegenbauri*; development of gonads. NEPPI & STIASNY 1913*b*, p. 70: as *O. gegenbauri*; Trieste, Adriatic Sea. VANHÖFFEN 1913*b*, p. 22: *E. gegenbauri*; comparison with other species; Gibraltar. INT. PLANKT. CATAL. 1916, p. 43: as *O. gegenbauri*; Ireland. KRAMP 1919, p. 101, as *O. gegenbauri*. SVERDRUP 1921, p. 25, fig. 4: as *E. campanulata* (?); Kristianiafjord, Norway. KRAMP 1927, p. 138, map: Denmark. KRAMP 1930, p. 30: as *O. gegenbauri*; S.W. North Sea; Strait of Dover. MAR. BIOL. ASS. 1931, p. 83: as *O. gegenbauri*; Plymouth. KRAMP 1933*a*, p. 588, fig. 58: synonyms and distribution. KRAMP 1937*b*, p. 110, fig. 49*b*: Denmark. RUSSELL 1938*b* pp. 413, 416, 419, 437: Plymouth. RUSSELL 1938*d*, p. 159, figs. 81–7: as *O. gegenbauri*; nematocysts. BABNIK 1948, pp. 33, 71: Adriatic Sea. KÜNNE 1952, pp. 12, 30, 32, 34, 41: S.E. North Sea. RUSSELL 1953, p. 367, Pl. 22, fig. 4, text-figs. 233–9: as *O. gegenbauri*; British coasts. KRAMP 1955*a*, p. 307: *Octorchandra canariensis* Haeckel ? = *E. gegenbauri*. ALVARIÑO

1957*a*, p. 15: as *O. gegenbauri*; western Mediterranean. ALVARIÑO 1957*b*, p. 24: as *O. gegenbauri*; Atlantic coast of Spain and Portugal. VANNUCCI 1957*d*, pp. 64, 65. KRAMP 1958*a*, pp. 123, 127: *E.* (*Octorchis*) *gegenbauri*; Villefranche, Mediterranean. KRAMP 1959*a*, pp. 161, 215, 218, 219, 223, fig. 221: diagnosis; distribution.

Eutima gentiana (Haeckel 1879)

8 mm wide, 10 mm high. Peduncle prismatic, as long as bell diameter; four long gonads on peduncle only. Eight tentacles with two pairs of lateral cirri; 16 marginal warts with lateral cirri. Eight marginal vesicles, each with 3–4 concretions.

HAECKEL 1879, p. 194, Pl. 12, figs. 6–9: as *Eutimeta gentiana* n.g., n.sp.; Canary Islands, W. Africa. MAYER 1910, p. 302: *Eutima gentiana.* ?VANHÖFFEN 1913*b*, p. 22: *E. gentiana,* = *E. levuka* Agassiz & Mayer and *Eutimeta lactea* Bigelow 1904; Amoy, China. BIGELOW 1919, p. 298: non = *E. levuka.* KRAMP 1955*a*, p. 307: non = *E. levuca* and *lactea.* VANNUCCI 1957*d*, pp. 64–6, 102. KRAMP 1959*a*, pp. 162, 224, 226, fig. 226: diagnosis; distribution.

Eutima gracilis (Forbes & Goodsir 1853)

Up to 13 mm wide, nearly hemispherical, jelly thick. Peduncle very long, narrow with small, conical base; stomach small, four simple lips; four gonads restricted to narrow portion of peduncle only, extending almost from base to stomach. Two or four long perradial tentacles; 40–80 or more marginal warts. Lateral cirri usually on all tentacle bulbs and warts; eight marginal vesicles, each with 1–6, usually three concretions.

FORBES & GOODSIR 1853, p. 311, Pl. 10, figs. 1–1*e*: as *Plancia gracilis* n.sp.; Scotland. KEFERSTEIN 1862, p. 29, figs. 3–8: as *Siphonorhynchus insignis* n.sp.; Atlantic coast of France. HAECKEL 1879, p. 190, Pl. 12, figs. 10–12: as *Eutimium elephas* n.sp.; Heligoland, North Sea; p. 192: as *Saphenia mirabilis.* MAYER 1910, p. 294, fig. 159: as *Saphenia gracilis.* ?MAYER 1910, p. 294: as *S. bitentaculata* (Quoy & Gaimard 1827) from Straits of Gibraltar. MAYER 1910, p. 299: as *Eutima insignis*; (British coasts and N.W. France). ?MAYER 1910, p. 300, Pl. 40, fig. 1: as *E. elephas*; Florida. NEPPI & STIASNY 1911, p. 398: *E. gracilis*; Trieste, Adriatic Sea. NEPPI 1912, p. 728: as *S. gracilis*; Adriatic Sea. APSTEIN 1913, p. 610: as *Eutimium elephas*; development of gonads. NEPPI & STIASNY 1913*b*, p. 69: *Saphenia gracilis*, sp. *A* and sp. *B.*; Trieste. LEBOUR 1917, p. 161: as *S. gracilis*; Plymouth. PELL 1918, pp. 22, 26: as *E. insignis*; Adriatic Sea. KRAMP 1919, p. 101: as *S. gracilis*, *E. insignis* and *elephas.* LEBOUR 1922, p. 664: as *S. gracilis*; food. LEBOUR 1923, p. 78, fig. 3*a*–*c*: as *S. gracilis*; food. PEACOCK 1924, p. 59: as *S. gracilis*; Cullercoats, England. KRAMP & DAMAS 1925, p. 314: as *E. elephas*; Bergen, Norway. RUSSELL 1925, p. 786: as *S. gracilis*; Plymouth. FLYNN 1927, p. 91: as *E. elephas*; Tasmania. KRAMP 1927, p. 134, map: as *S. gracilis*; Denmark; p. 136, map: as *E. insignis*; Denmark. RUSSELL 1927, p. 572: as *S. gracilis*; Plymouth. RUSSELL 1928, p. 86: as *S. gracilis*; Plymouth. SANDERSON 1930, p. 228: as *S. gracilis*; Northumberland coast, England. MAR. BIOL. ASS. 1931, p. 83: as *E. insignis* and *S. gracilis*; Plymouth. RUSSELL 1931*b*, p. 772, tab. I: as *S. gracilis*; Plymouth. KRAMP 1933*a*, p. 586, fig. 55: as *S. gracilis*; p. 588, fig. 56: as *E. insignis*; fig. 57: as *E. elephas*; distribution. RUSSELL 1933, tab. I: as *S. gracilis*; Plymouth. RANSON 1934*a*, p. 75: *Saphenia* =

Eutima. Ranson 1934*b*, p. 180: as *E. elephas*, =*insignis* Ranson 1925; off Portugal. Kramp 1937*b*, p. 108, fig. 49*a*: as *S. gracilis*; Denmark; p. 109, fig. 48*b*: as *E. insignis*; Denmark; p. 109: as *E. elephas*. Moore 1937, p. 50: as *S. gracilis* and *E. insignis*; Isle of Man. Pell 1938, p. 925: as *E. insignis*; Adriatic Sea. Russell 1938*b*, pp. 413, 416, 418, 419, 437: as *S. gracilis*; pp. 413, 418: as *E. insignis*; Plymouth. Russell 1938*d*, p. 157, figs. 55–9: as *S. gracilis*; nematocysts. Babnik 1948, p. 32: as *S. gracilis*; Adriatic Sea; p. 71: biological remarks. Russell 1949, pp. 479, 480, fig. 1: hydroid of *Eutima gracilis*. Franc 1951, p. 28: as *E. insignis*; French coast of Channel. Künne 1952, pp. 12, 32: as *E. insignis*; S.E. North Sea. Russell 1953, p. 359, Pl. 22, fig. 1, text-figs. 226–32: *Eutima gracilis*, =*E. insignis*; British coasts. Southward 1954, p. 19: Irish Sea. Hure 1955, p. 6: as *S. gracilis*; Adriatic Sea. Kramp 1955*a*, p. 263: *E. elephas* probably =*E. gracilis*; Gulf of Guinea. Alvariño 1957*a*, p. 16: Western Mediterranean. Vannucci 1957*d*, pp. 65, 66. Aurich 1958, p. 215: as *S. gracilis*; frequency of occurrence in S.E. North Sea. Kramp 1958*a*, pp. 123, 127: Villefranche, Mediterranean. Kramp 1959*a*, pp. 162, 215, 219, 223, 227, fig. 224: diagnosis; distribution.

Eutima hartlaubi Kramp 1958

15 mm wide, flatter than a hemisphere, jelly fairly thick. Peduncle slender, tapering, about half as long as diameter of bell. Eight gonads, four on subumbrella extending almost from base of peduncle to bell margin, and four short on middle portion of peduncle. 12–14 large tentacles without cirri; about 32 marginal warts with lateral cirri. A large, spherical, gelatinous protuberance above the base of each tentacle.

Hartlaub 1909*b*, p. 456, Pl. 20, figs. 11–15: as *Octorchandra orientalis* n.sp.; Djibuti, E. Africa. Mayer 1910, p. 495: *O. orientalis* ? =*Eutima campanulata.* Vannucci 1957*d*, p. 64: as *E. orientalis.* Kramp 1958*b*, p. 358, fig. 4: *Eutima hartlaubi* nov. nom.; Nicobars, Indian Ocean.

Eutima japonica Uchida 1925

4·5 mm wide, jelly thick. Peduncle short; four gonads extending from bell margin to short way down the peduncle. Eight tentacles, the perradial longer than the interradial, with lateral cirri. In each octant four marginal warts, the two middle ones larger and with lateral cirri.

Uchida 1925*b*, p. 93, fig. 17: *Eutima japonica* n.sp.; Japan. Vannucci 1957*d*, pp. 65, 66. Yamazi 1958, p. 136: Tanabe Bay, Japan.

Eutima levuka (Agassiz & Mayer 1899)

Up to 15 mm wide, flatter than a hemisphere, jelly fairly thin. Peduncle slender, 1½ times as long as diameter of bell; eight gonads, four on middle portion of peduncle and four on subumbrella. Usually eight tentacles, sometimes more, with lateral cirri; up to 100 marginal warts with cirri.

Agassiz & Mayer 1899, p. 163, Pl. 9, figs. 30, 31: *Eutimeta levuka* n.sp.; Fiji Islands, Pacific Ocean. Mayer 1910, p. 300, fig. 164: as *E. lactea* (Bigelow 1904) from Maldive Islands, Indian Ocean; p. 301: *E. levuka*; p. 302: as *E. levuka* var. *ocellata* Maas 1905 from Malayan Archipelago. Apstein 1913, p. 611: as *Eutimeta levuca*;

development of gonads. Bigelow 1919, p. 299: *E. levuka*, =*Eutimeta lactea* Bigelow 1904, *E. lactea* Mayer 1910, *E. levuka* var. *ocellata* Maas 1905, ?*E. levuka* Bigelow 1909; Philippines. Stiasny 1928*b*, p. 208; Java Sea. Kramp 1953, p. 288: non = *E. levuka* Bigelow 1904; N.E. Australia. Chiu 1954*a*, p. 43, Pl. 3, fig. 13: as *E. campanulata*; Amoy, China. Chiu 1954*b*, pp. 51, 52: as *E. campanulata* and *levuka*; China. Vannucci 1957*d*, pp. 65, 102.

Eutima mira McCrady 1857

Up to 30 mm wide, as broad as high. Peduncle long, slender, tapering; stomach small, flask-shaped; four simple, recurved lips; eight gonads, four along greater part of peduncle and four on subumbrella extending from base of peduncle outwards. Four long tentacles with or without cirri; about 100 marginal warts, some of which have cirri; eight marginal vesicles each with 4–8 concretions.

McCrady 1857, p. 190, Pl. 11, figs. 8, 9: *Eutima mira* n.g., n.sp.; South Carolina, U.S.A. Mayer 1910, p. 295, Pl. 39, fig. 1, Pl. 40, figs. 3, 3′, text-figs. 160, 161: from Woods Hole to Florida, east coast of U.S.A. Vanhöffen 1913*a*, p. 424: Tortugas, Florida. ?Vanhöffen 1913*b*, p. 23: Amoy, China. Bigelow 1914*b*, p. 18: New England, east coast of U.S.A. Fish 1926, p. 125: Woods Hole, east coast of U.S.A. Kramp 1933*a*, p. 589, fig. 59: as *E.* (*Octorchis*) *mira*; distribution. Ranson 1934*a*, p. 73. Berrill 1950, p. 311, fig. 10A–E: as *E. variabilis*. Vannucci 1957*d*, pp. 63, 98, 102, 103: Brazil; discussion. Kramp 1959*a*, pp. 161, 211, 231, fig. 222: diagnosis; distribution.

Eutima modesta (Hartlaub 1909)

8 mm wide, flat, with thin walls. Peduncle about half as long as diameter of bell, slender, tapering; four gonads, on subumbrella only, a little nearer to peduncle than to margin. 16 tentacles with swollen bulbs, with lateral cirri; 16 or more marginal warts, with lateral cirri.

Hartlaub 1909*b*, p. 454, Pl. 19, figs. 6, 7: as *Eutimalphes modesta* n.sp.; Djibouti, E. Africa. Mayer 1910, p. 496: *Eutima modesta*. Ranson 1934*b*, p. 180: as *Eutimalphes modesta*, type-species of this genus.

Eutima orientalis (Browne 1905)

5–6 mm wide. Peduncle twice as long as bell diameter, with dome-like base and elongate, prismatic central part; eight gonads, four on peduncle and four on subumbrella. Four tentacles, with lateral cirri; 60–80 marginal warts, with lateral cirri.

Browne 1905*b*, p. 139, Pl. 3, fig. 4: as *Octorchis orientalis* n.sp.; Ceylon. Mayer 1910, p. 299: *Eutima orientalis*. Vanhöffen 1913*b*, p. 23: as *E. mira*; *E. orientalis* is considered = *E. mira*; Ceylon; ?Amoy, China. Menon 1931, p. 503: Madras, India. Menon 1932, p. 18: as *E. mira*, agrees with Vanhöffen; Madras, India. Nair 1951, p. 63: as *E. mira*; Trivandrum coast, India. Russell 1953, p. 367: probably = *O. gegenbauri*. Vannucci 1957*d*, p. 64. ?Ganapati & Nagabhushanam 1958, pp. 92, 94: as *E. mira*; Vizagapatam coast, India. Kramp 1958*b*, p. 357: *E. orientalis* is retained; Nicobars; Vizagapatam, east coast of India.

Eutima variabilis McCrady 1857

30 mm wide, about three times as wide as high; jelly quite thick. Peduncle about twice as long as bell diameter, conical; eight gonads, four on subumbrella extending from near margin to base of peduncle and four near proximal end of peduncle. 16 tentacles of equal length, with lateral cirri; usually three marginal warts between successive tentacles, with cirri; eight or 12 marginal vesicles.

McCrady 1857, p. 190: *Eutima variabilis* n.sp.; South Carolina, east coast of U.S.A. Haeckel 1879, p. 199: as *Octorchandra variabilis.* Mayer 1910, p. 312, Pl. 38, fig. 4, Pl. 39, fig. 2: as *Eirene variabilis*; South Carolina; Tortugas, Florida. Kramp 1959*a*, pp. 161, 231, 233, fig. 223: diagnosis; distribution.

Genus ***Eutimalphes*** Haeckel 1879

Eutimidae with eight adradial statocysts; with numerous tentacles and marginal cirri.

Type-species: *E. pretiosa* Haeckel.

Haeckel 1879, p. 194: *Eutimalphes* n.g. Ranson 1934*b*, p. 177: new definition. Kramp 1953, p. 308: the genus *Eutimalphes* is temporarily retained.

Eutimalphes brownei Torrey 1909

15 mm wide, hemispherical, jelly thick. Peduncle wide, conical, short. Mouth with four wide, frilled lips; gonads on subumbrella portions of radial canals only. About 130 short tentacles with bulbous bases flanked by one to three pairs of long, slender cirri. No marginal warts.

Torrey 1909, p. 25, fig. 10: *Eutimalphes brownei* n.sp.; San Diego, California. Mayer 1910, p. 495: as *Eutima brownei.* Foerster 1923, pp. 225, 261: specimens with or without cirri, *Eutimalphes brownei* and as *Eutonina brownei.*

Eutimalphes pretiosa Haeckel 1879

40 mm wide, 20 mm high; jelly thick. Peduncle broad, conical, about half as long as bell diameter. Stomach large; very large lips, complexly folded; gonads continuous, extending along almost entire length of radial canals. 60–80 very short tentacles and a few marginal warts. Numerous marginal cirri.

Haeckel 1879, p. 195, Pl. 11, fig. 8: *Eutimalphes pretiosa* n.g., n.sp.; Australia. Mayer 1910, p. 305, fig. 169: as *Eutima pretiosa.* Flynn 1927, p. 91: as *Eutima pretiosa*; Tasmania. Kramp 1953, p. 308: discussion; *Eutimalphes* is temporarily retained for this species only.

Genus **Eutonina** Hartlaub 1897

Eutimidae with eight marginal vesicles; without cirri; without marginal warts; with gonads restricted to subumbrella.

Type-species: *E. indicans* (Romanes).

Hartlaub 1897, p. 506: *Eutonina* n.g. Mayer 1910, p. 305: as synonym of *Eutimium.* Bigelow 1913, p. 34: *Eutonina*; discussion of names. Foerster 1923, p. 225: discussion; comparison between *Eutonina* and *Eutimium*, *Eutimalphes* and *Eutima.* Ranson 1934*b*, p. 177: new definition.

Eutonina indicans (Romanes 1876)

25–35 mm wide, slightly flatter than a hemisphere; jelly rather thick. Peduncle thick, conical; stomach short, four folded lips; gonads linear, sinuous, along nearly whole subumbrellar portion of radial canals. About 200 short tentacles; marginal vesicles with about 12 concretions.

Romanes 1876*b*, p. 525: as *Tiaropsis indicans* n.sp.; Scotland. Haeckel 1879, p. 195: as *Eutimalphes indicans.* Hartlaub 1897, p. 506, Pl. 22, figs. 1, 3, 4, 6, 7, Pl. 20, figs. 19, 20: as *Eutonina socialis* n.g., n.sp.; S. North Sea. Mayer 1910, p. 306, fig. 169*a*: as *Eutimium socialis.* Apstein 1913, p. 611: as *Eutonina socialis*; development of gonads. Bigelow 1913, p. 34: *Eutonina indicans*; Dutch Harbour, North Pacific Ocean. Kramp 1915, p. 10: as *Eutonina socialis*; Great Belt and Kattegat, Denmark. Kramp 1919, p. 98, chart XIII: northern Atlantic Ocean. Foerster 1923, p. 262: Vancouver, Pacific coast of Canada. Kramp & Damas 1925, p. 313: Norway. Ussing 1925, p. 73: Little Belt, Denmark. Kramp 1927, p. 128, map: Denmark. Stiasny 1929*a*, p. 127: coast of Holland. Kramp 1930, p. 31: S.W. North Sea. Sanderson 1930, p. 228: Northumberland coast, England. Watson 1930, p. 236: Northumberland coast, England. Runnström 1932, p. 30: Herdlafjord, Norway. Thiel 1932*a*, p. 147. Thiel 1932*b*, pp. 443 ff.: distribution. Kramp 1933*a*, p. 585, fig. 54: distribution. Uchida 1933*a*, p. 131, fig. 7: S.W. Kamchatka. Künne 1935, p. 65: western Baltic Sea. Kramp 1937*b*, p. 106, figs. 5A, 48*a*: Denmark. Künne 1937*b*, p. 6: *E. indicans* and as *?Eucopium quadratum*; Baltic Sea. Uchida 1938*c*, p. 53: Japan. Kramp 1939*a*, p. 15: Iceland. Uchida 1940*a*, p. 289, fig. 5: Japan. Maaden 1942*a*, p. 354: Holland. Künne 1948, pp. 174–6, fig. 4: with larvae of *Peachia hastata.* Fraser 1949*b*, p. 66: northern North Sea. Fraser 1950, p. 94: Scotland. Kändler 1950, p. 68: Fehmarnbelt, western Baltic Sea. Künne 1952, pp. 12, 32: S.E. North Sea. Rees 1953*a*, p. 8: Herdlafjord, Norway. Russell 1953, p. 374, Pl. 22, fig. 2, text-figs. 240–5: British coasts. Kramp 1955*b*, p. 157: by Haeckel 1879 determined as *Irene viridula.* Naumov 1956*b*, p. 37: as *Eutimium indicans.* Vannucci 1956*b*, pp. 246, 247, 249: Clyde Sea, Scotland. Aurich 1958, p. 215: frequency of occurrence in S.E. North Sea. Bossanyi 1958, pp. 356, 362, 364: Northumberland, England. Carthy 1958, p. 242: as *Tiarcpsis indicans*; response to stimuli. Howe 1959, p. 1963: Scotland. Kramp 1959*a*, pp. 163, 215, 216, 218, 220, 221, 271, fig. 227: diagnosis; distribution.

Eutonina scintillans (Bigelow 1909)

10 mm wide, 5 mm high, jelly thick. Peduncle short; stomach globular; four simple or slightly crenulated lips; gonads extending along distal 1/4 – 1/3 of radial canals; marginal vesicles with 2–5 concretions.

Bigelow 1909*a*, p. 167, Pl. 5, figs. 8, 9, Pl. 37, fig. 11: as *Eutimalphes scintillans* n.sp.; Pacific coast of Mexico. Mayer 1910, p. 306: as *Eutimium scintillans.* Neppi & Stiasny 1911, p. 557: Trieste, Adriatic Sea. Neppi & Stiasny 1913*b*, p. 70, Pl. 4, fig. 36: as *Eutimium scintillans*; Adriatic Sea. Foerster 1923, p. 262: discussion. Ranson 1934*b*, p. 178: new description; Djibouti, east coast of Africa. Kramp 1959*a*, pp. 163, 223, 225, 268: diagnosis; distribution.

Genus ***Irenium*** Haeckel 1879

Eutimidae (?) with numerous marginal vesicles; with numerous marginal warts; tentacles and warts with lateral cirri. Four gonads along the radial canals.

Type-species: *I. quadrigatum* Haeckel.

Haeckel 1879, p. 199: *Irenium* n.g. Mayer 1910, p. 311: synonym of *Eirene.*

Irenium quadrigatum Haeckel 1879

15 mm wide, 8 mm high, jelly very thick. Peduncle short, with very broad base; stomach pyriform; four short, folded lips; four gonads along almost entire length of radial canals. Four very long perradial tentacles; 30–40 marginal warts with excretory papillae (!); 120–160 cirri; 60–80 statocysts, each with 4–6 concretions.

Haeckel 1879, p. 199, Pl. 11, figs. 12, 13: *Irenium quadrigatum* n.g., n.sp.; Morocco. Mayer 1910, p. 313, fig. 173: as *Eirene quadrigatum.* Kramp 1959*a*, pp. 165, 224, 226, fig. 230: diagnosis; distribution.

Irenium teuscheri (Haeckel 1879)

40 mm wide, 20 mm high; jelly thick at apex. Peduncle as long as bell diameter, pyramidal, about three times as long as broad; stomach fairly small, with large, folded lips; gonads wavy, along entire length of radial canals; eight large and 40 small tentacles. 60–80 marginal warts and between them 60–80 spiral cirri; 70–80 statocysts, each with 2–4 concretions.

Haeckel 1879, p. 206, Pl. 12, figs. 3–5: as *Tima teuscheri* n.sp.; off coast of Brazil. Mayer 1910, p. 319, fig. 179: as *T. teuscheri.* Kramp 1959*a*, p. 165, fig. 231: diagnosis; distribution; provisionally referred to *Irenium.*

Genus ***Tima*** Eschscholtz 1829

Eutimidae with numerous marginal vesicles; without cirri; with marginal warts; with gonads upon entire length of radial canals.

Type-species: *T. flavilabris* Eschscholtz.

Eschscholtz 1829, p. 103: *Tima* n.g. Haeckel 1879, p. 203. Mayer 1910, p. 314. Ranson 1934*b*, p. 177: new definition. Petersen 1957, p. 39: discussion of species.

Tima bairdi (Johnston 1833)

50–65 mm wide, hemispherical or somewhat higher, jelly very thick. Gastric peduncle thick, conical, about as long as diameter of umbrella. Stomach fairly small, four large, folded lips; gonads much folded in regular waves. Normally 16 long tentacles with endodermal abaxial spur; between successive tentacles about 12 marginal warts and half as many marginal vesicles, each with 4–20 concretions.

JOHNSTON 1833, p. 320, fig. 41: as *Dianaea bairdii* n.sp.; Scotland. FORBES 1848, p. 37, Pl. 5, figs. 1–1*b*: *Tima bairdii*. MAYER 1910, p. 319: *T. bairdii* possibly the young of *T. formosa*. KRAMP 1915, p. 10: Kattegat, Denmark. KRAMP 1919, p. 102, Pl. 5, figs. 4–10: comparison with other species; Denmark; North Sea. STORROW 1922, p. 18: Cullercoats, England. COY 1924, p. 56: Cullercoats, England. KRAMP & DAMAS 1925, p. 314: Norway. USSING 1925, p. 73: as *Tima* sp.; Frederikshavn, Denmark. KRAMP 1927, p. 141, map: Denmark. SANDERSON 1930, p. 228: Northumberland coast, England. WATSON 1930, p. 236: Northumberland coast, England. SAVAGE 1931, p. 36: east coast of England. RUNNSTRÖM 1932, p. 29: Herdlafjord, Norway. KRAMP 1933*a*, p. 592, fig. 62: distribution. KRAMP 1937*b*, p. 114, fig. 52: Denmark. KÜNNE 1937*a*, pp. 138, 151, 155, 157, 159, 161: North Sea. KÜNNE 1937*b*, p. 6: Baltic Sea. RUSSELL 1939*a*, pp. 174, 177: North Sea. RUSSELL 1953, p. 379, Pl. 22, fig. 3, text-figs. 246–9; east coasts of British Isles. PETERSEN 1957, p. 40: discussion. KRAMP 1959*a*, pp. 163, 215, 218, 219, 220, 222, fig. 228: diagnosis; distribution.

Tima flavilabris Eschscholtz 1829

60–80 mm wide, flatter than a hemisphere, jelly thick. Peduncle conical with broad base, about as long as diameter of umbrella; gonads wavy. 70–80 tentacles; between successive tentacles three marginal warts and four marginal vesicles.

ESCHSCHOLTZ 1829, p. 103, Pl. 8, fig. 3: *Tima flavilabris* n.sp.; N.E. of Azores. MAYER 1910, p. 319. KRAMP 1919, p. 104: =*T. lucullana*. PETERSEN 1957, p. 38: North Atlantic, new records; p. 40: discussion. KRAMP 1959*a*, pp. 164, 222, 223, 226: diagnosis; distribution.

Tima formosa L. Agassiz 1862

100 mm wide, 65 mm high, thick at apex. Peduncle as long as diameter of bell; stomach small, with large lips. About 32 marginal tentacles; between successive tentacles three marginal warts and four marginal vesicles.

L.AGASSIZ 1862, p. 362: *Tima formosa* n.sp.; New England, east coast of U.S.A. HAECKEL 1879, p. 205. MAYER 1910, p. 317, Pl. 41, figs. 1–3, text-fig. 178. BIGELOW 1914*b*, p. 18: New England. KRAMP 1919, p. 104: comparison with *T. bairdi*. ?UCHIDA 1925*b*, p. 92: Japan. BIGELOW 1926, p. 38: as *T. bairdii*; Gulf of Maine, east coast of U.S.A. FISH 1926, p. 124: Woods Hole, east coast of U.S.A. KRAMP 1933*a*, p. 592: *T. formosa* larger specimens of *T. bairdi*?; distribution. ?UCHIDA 1938*c*, p. 53: Japan. PETERSEN 1957, p. 40: discussion. ?CHOW &

HUANG 1958, pp. 185, 189, Pl. 4, fig. 37, Pl. 5, fig. 38: Chefoo, China. (Same species as in Uchida 1925*b*.) KRAMP 1959*a*, pp. 164, 211, 212: diagnosis; distribution; ? = *T. flavilabris*.

Tima lucullana (Delle Chiaje 1822) *

Up to 74 mm wide, flatter than a hemisphere; jelly thin. Peduncle somewhat longer than bell cavity; stomach small with large lips; 60–70 tentacles, all short; seven marginal warts between successive tentacles. Number of statocysts usually 8.

DELLE CHIAJE 1822, Pl. 74, figs. 1, 2: as *Dianaea lucullana* n.sp.; Mediterranean. MAYER 1910, pp. 314, 496, fig. 177: *Tima lucullana*. NEPPI & STIASNY 1913*b*, p. 74: as *T. flavilabris*; Trieste, Adriatic Sea. KRAMP 1919, p. 104: = *T. flavilabris*. NEPPI 1919, p. 121: abnormal specimen; Naples, Italy. NEPPI 1920*a*, p. 59: Naples. PETERSEN 1957, p. 39: discussion. KRAMP 1959*a*, pp. 164, 223, fig. 229: diagnosis; distribution.

Tima saghalinensis Bigelow 1913

100 mm wide. Peduncle very short, lips much folded. Numerous tentacles (all broken), about 300 statocysts, each with 8–10 concretions.

BIGELOW 1913, p. 35: *Tima saghalinensis* n.sp.; Saghalin Island, N. of Japan. THIEL 1932*a*, p. 147. THIEL 1932*b*, pp. 443 ff.: distribution. NAUMOV 1956*b*, pp. 37, 40: Ochotian Sea (new record).

Family *AEQUOREIDAE*

Leptomedusae with very broad stomach; usually without peduncle; with many simple or branched radial canals; with gonads on radial canals separated from stomach; with hollow marginal tentacles; with excretory pores; without marginal or lateral cirri; with closed marginal vesicles; with or without ocelli. Hydroids, where known, tentacles with webs, hydrotheca with operculum.

Genus ***Aequorea*** Péron & Lesueur 1809

Aequoreidae with numerous simple radial canals. Subumbrella without rows of papillae. The species are more or less doubtful.

Type-species: *A. aequorea* (Forskål).

PÉRON & LESUEUR 1809, p. 336: *Aequorea* n.g. MAYER 1910, p. 324. BIGELOW 1913, p. 36. BIGELOW 1919, pp. 308–11: *Aequorea*, incl. *Zygodactyla*. BIGELOW 1938, p. 110: discussion of species, especially *A. tenuis* and *floridana*. RANSON 1949, p. 129: discussion; joins *Zygodactyla* with *Aequorea*.

Aequorea aequorea (Forskål 1775)

Up to 175 mm wide, saucer-shaped, thick in centre, gradually thinning towards margin. Stomach usually half as wide as umbrella; radial canals usually 60–80, sometimes fewer or up to 160; gonads extending along almost whole length of radial canals; tentacles usually less numerous than radial canals but varying from half to twice as many; small bulbs few, scattered; tentacle bulbs elongated conical, excretory pores on short papillae; 5–10 statocysts between successive radial canals.

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* See Addenda, p. 445.

Forskål 1775, p. 110: as *Medusa aequorea* n.sp.; Mediterranean. Péron & Lesueur 1809, p. 336: as *Aequorea forskalea* n.g. Mayer 1910, p. 325, Pl. 22, figs. 1–4, text-figs. 186, 187: as *Ae. forskalea* in part; (North Atlantic; Mediterranean). Neppi 1912, p. 729: as *Ae. forskålea*; coast of Dalmatia, Adriatic Sea. ?Bigelow 1913, p. 38: to Mayer's list of synonyms are added: *Ae. globosa* Eschscholtz 1829, *albida* A. Agassiz 1862 and *Mesonema victoria* Murbach & Shearer 1902; ?*Aequorea aequorea* var. *aequorea* from Union Bay, British Columbia and Puget Sound. Le Danois 1913*d*, p. 312, fig. 8: as *Ae. forskålea*; Bay of Biscay; south of Ireland. Neppi & Stiasny 1913*b*, p. 75: as *Ae. forskålea*; Trieste, Adriatic Sea. Vanhöffen 1913*a*, p. 424, fig. B: as *Ae. forskålea*, =*Ae. floridana* Mayer 1910; Tortugas, Florida. Bigelow 1915*b*, pp. 316, 319: between New York and Chesapeake Bay. ?Fraser 1916, pp. 99–101, figs. 1–8: as *Ae. forskålea*; development; Departure Bay, west coast of North America. ?Bigelow 1918, p. 387: near Chesapeake Bay, east coast of U.S.A. Pell 1918, pp. 22, 27: as *Ae. forskalea*; Adriatic Sea. Kramp 1919, p. 107: as *Ae. forskålea*. ?Weese & Townsend 1921, pp. 117–28: as *Aequorea*; physiology; Puget Sound, British Columbia. Bigelow 1922, p. 159: off Delaware, east coast of U.S.A. Alvarado 1923*b*, pp. 49 ff., Pl. 9: as *Ae. forskalea*; histology. Lebour 1923, p. 75, fig. 2*a–c*: as *Aequorea* sp.; food. Kramp 1924, p. 20: as *Ae. forskålea*; Mediterranean. Kramp & Damas 1925, p. 316: as *Ae. forskålea*; Norway. Ranson 1925*b*, p. 381: as *Ae. forskålea*; off Portugal. ?Strong 1925, p. 385: as *Ae. victoria*; development; Puget Sound, British Columbia. Schodduyn 1926, p. 42: as *Ae. forskalia*; Pas de Calais, English Channel. Russell 1927, p. 572: as *Ae. forskålea*; Plymouth. Kramp 1930, p. 32: as *Ae. forskålea*; S.W. North Sea. Sanderson 1930, p. 228: as *Ae. forskålea*; Northumberland coast, England. Mar. Biol. Ass. 1931, p. 83: as *Ae. forskålea*; Plymouth. Kramp 1933*a*, p. 593, fig. 63: as *Ae. forskålea*; distribution. Russell 1933, tab. I: as *Ae. forskålea*; Plymouth. Ranson 1936*b*, p. 118: as *Ae. forskålea*; Baleares; west of Bretagne and Vendée, France. Kramp 1937*b*, p. 119, fig. 53: as *Ae. forskålea*. Moore 1937, p. 50: as *Ae. forskålea*; Port Erin, Isle of Man. Pell 1938, p. 925: as *Ae. forskålea*; Adriatic Sea. Russell 1938*b*, pp. 413, 416, 417, 419, 437: as *Ae. forskålea*; Plymouth. Rees 1939*b*, pp. 438–40: discussion of the hydroid. Renouf 1939, p. 523: as *Ae. forskålea*; south coast of County Cork, Eire. Russell 1939*e*, p. 348, figs. 1*a–c*, 2*a*: as *Ae. forskålea*; comparison with *Ae. vitrina* and *pensilis*; nematocysts. ?Hyman 1940, pp. 282 ff.: physiology; Puget Sound, British Columbia. Maaden 1942*a*, p. 354: as *Ae. forskålea*; Holland. Kolosvary 1945, p. 139: as *Ae. forskalea*; Canal di Mezzo, Adriatic Sea. Babnik 1948, *p*. 38: as *Ae. forskålea*; Adriatic Sea. Fraser & Saville 1949*b*, pp. 62, 63: as *Ae. forskalea*; Moray Firth, Scotland. Moore 1949, p. 6: as *Ae. forskålea*: Bermuda. Ranson 1949, p. 128: as *Ae. forskålea*; Senegal, W. Africa. Russell 1953, p. 342, Pl. 21, fig. 3, Pl. 32, figs. 1, 2, text-figs. 220, 221: as *Ae. forskalea*; synonyms; British coasts. Horridge 1955*b*, pp. 642–8: as *Ae. forskalea*; physiology. Kramp 1955*a*, p. 265: Gulf of Guinea, W. Africa. ?Naumov 1956*b*, p. 37: as *Ae. forskalea*; Bering Sea. Kramp 1957*a*, pp. 37, 124: variation; coast of Southern Patagonia; S.W. of Cape of Good Hope; off Walvis Bay, S. Africa. Kramp 1957*b*, p. 235: Iranian Gulf. Ebbecke 1957, p. 151: *Aequorea*; reflex-investigations. Hoenigman 1958, pp. 261–2: as *Ae. forskalea*; Adriatic Sea.

KRAMP 1959*a*, pp. 37, 167, 211, 214, 215, 216, 218, 220, 223, 225, 227, 231, 235, 237, 271, fig. 234*a*, *b*: west of the Azores; diagnosis; distribution. KRAMP 1959*b*, p. 9: off Congo, W. Africa. WERNER 1959*a*, pp. 33, 36: as *Ae. forskalea*; Port Erin, Isle of Man.

Aequorea albida A. Agassiz 1862

About 60 mm wide, higher than a hemisphere (?); thick in centre. Stomach 1/3 – 1/2 as wide as umbrella; 80–100 radial canals; gonads extending along almost whole length of radial canals; 2–3 times as many tentacles as radial canals and 2–3 times as many small bulbs as tentacles; tentacle bulbs fusiform with abaxial spur and with excretory papillae; statocysts about twice as many as tentacles.

A. AGASSIZ (in L. Agassiz 1862), p. 359: *Aequorea albida* n.sp.; east coast of U.S.A. MAYER 1910, p. 331, Pl. 43, figs. 1–5, text-fig. 189: *Ae. albida*, probably a northern variety of *Ae. forskalea*; northern New England, U.S.A. BIGELOW 1913, p. 40: as *Ae. aequorea* var. *albida*; Dutch Harbour, west coast of N. America. BIGELOW 1914*b*, p. 18: as *Ae. aequorea* var. *albida*; New England. KRAMP 1933*a*, p. 595, fig. 65: distribution. KRAMP 1959*a*, pp. 166, 211, 212: diagnosis; distribution.

Aequorea australis Uchida 1947

11–25 mm wide, lower than a hemisphere, jelly rather thin. Diameter of stomach a little less than half of that of umbrella. 16–29 radial canals; gonads about half as long as radial canals, nearer to margin than to stomach; 16–29 tentacles and a varying number of small bulbs; statocysts about same number as tentacle bulbs with excretory papillae.

?VANHÖFFEN 1913*b*, p. 24, fig. 4: as *Ae. forskalea*; Amoy and Hong Kong, China. UCHIDA 1947*a*, p. 307, fig. 8: *Aequorea australis* n.sp.; North Australia; New Guinea. KRAMP 1953, p. 290, fig. 7: variation and comparison with *Ae. globosa*; morphological remarks; Great Barrier Reef, Australia. CHOW & HUANG 1958, pp. 184, 189, Pl. 4, figs. 33, 34: Chefoo, China. ?KRAMP 1959*c*, p. 256: Philippines; young medusa.

Aequorea coerulescens (Brandt 1838)

Up to 145 mm wide, usually 60–80 mm, low and thick. Stomach about half as wide as umbrella; about 100 radial canals; gonads extending along almost whole length of radial canals; 3–6 times as many tentacles as radial canals and numerous small bulbs; tentacle bulbs elongated, laterally compressed, with prominent excretory papillae; statocysts numerous, crowded.

BRANDT 1838*a*, p. 360, Pl. 5: as *Zygodactyla* (*Mesonema*) *coerulescens* n.sp.; northern Central Pacific. BIGELOW 1909*a*, p. 177, Pl. 4, fig. 4, Pl. 35, figs. 3–8: *Aequorea coerulescens*; eastern tropical Pacific. MAYER 1910, p. 326: ?as synonym of *Ae. forskalea.* FOERSTER 1923, p. 263: localities of W. America. UCHIDA 1927*b*, p. 222, fig. 2: *Ae. coerulescens*, incl. *Mesonema pensile* Maas 1909; Yunoshima, Japan. BOONE 1938, p. 35, Pls. 5, 6: Valparaiso, Chile. UCHIDA 1938*b*, p. 42: Japan. UCHIDA 1947*b*, p. 336: Japan. RANSON 1949, p. 128: off Luderitz Bay, S.W. Africa. KRAMP 1957*a*, pp. 40, 97, 124: off Peru; Falkland Islands. CHOW & HUANG 1958, pp. 184, 189, Pl. 4, figs. 35, 36: Chefoo, China. UCHIDA 1958, p. 164: Sado, Japan. YAMAZI 1958, p. 136: Tanabe Bay, Japan. KRAMP 1959*a*, pp. 166, 227, 230, 235, 237, 270: diagnosis; distribution.

Aequorea conica Browne 1905

9 mm wide, 10–12 mm high, conical, jelly very thick. Stomach half as wide as diameter of umbrella, often broad and flat; lips long and slender, with an inward furrow which continues along inside of stomach to the radial canals; about 16 radial canals; gonads along proximal half portion of radial canals; 26–30 tentacles and as many small bulbs; about twice as many statocysts as tentacles; no excretory papillae.

BROWNE 1905*b*, p. 145, Pl. 1, fig. 2, Pl. 2, figs. 16–18: *Aequorea conica* n.sp.; Gulf of Manaar, between Ceylon and India. MAYER 1910, p. 334. STIASNY 1928*b*, p. 213: Java Sea; Singapore. UCHIDA 1947*a*, p. 309: comparison with *Ae. australis*. NAIR 1951, p. 68: Trivandrum coast, India. KRAMP 1953, p. 289: N.E. Australia. CHIU 1954*a*, pp. 41, 45, Pl. 4, figs. 15, 16: Amoy, China. CHIU 1954*b*, pp. 51, 52, 53: China. GANAPATI & NAGABHUSHANAM 1958, pp. 92, 94: Vizagapatam coast, India. KRAMP 1958*b*, p. 360: Mergui Archipelago, Indian Ocean.

Aequorea cyanea de Blainville 1834

Unidentifiable species.

DE BLAINVILLE 1834, p. 277, Pl. 32, fig. 2: *Aequorea cyanea* n.sp.; New Guinea. HAECKEL 1879, p. 222: as *Rhegmatodes thalassina* (Péron & Lesueur), probably a young specimen of *Ae. cyanea* Blainville; north coast of Australia. MAYER 1910, pp. 326, 329: unidentifiable, possibly = *Ae. forskalea*.

Aequorea eurhodina Péron & Lesueur 1809

Unidentifiable species.

PÉRON & LESUEUR 1809, p. 336: *Aequorea eurhodina* n.sp; Bass Strait, Australia. HAECKEL 1879, p. 220. BIGELOW 1909*a*, p. 172: unidentifiable. MAYER 1910, pp. 326, 329: possibly = *Ae. forskalea*.

Aequorea floridana (L. Agassiz 1862)

30–50 mm wide, flatter than a hemisphere, thick in centre. Stomach about 1/5 as wide as umbrella; about 16 radial canals; gonads extending along almost whole length of radial canals; 80–100 tentacles and 1–3 times as many small bulbs; tentacle bulbs fusiform, with short abaxial spurs and with excretory papillae; statocysts 1–2 or three times as many as tentacles.

L. AGASSIZ 1862, p. 361: as *Rhegmatodes floridanus* n.sp.; Florida. MAYER 1900*b*, p. 61: *Aequorea floridana*; Florida. MAYER 1910, p. 330, Pl. 43, figs. 6, 7: possibly a variety of *Ae. forskalea*. BIGELOW 1913, p. 37: discussion of the species. BIGELOW 1919, p. 309: discussion. BIGELOW 1938, p. 111: comparison with *Ae. tenuis*, which is probably a separate species; Bermudas. RUSSELL 1940*a*, p. 521: nematocysts. KRAMP 1959*a*, pp. 166, 231, 233: diagnosis; distribution. SUAREZ-CAABRO 1959, p. 27: Cuba, Caribbean Sea.

Aequorea globosa Eschscholtz 1829

20–40 mm wide, almost hemispherical, jelly very thick. Stomach about half as wide as diameter of umbrella; gonads extending along almost entire length of the radial canals; 30–40 radial canals, same number of tentacles and about twice as many small bulbs; about twice as many statocysts as tentacles. No excretory papillae.

ESCHSCHOLTZ 1829, p. 110, Pl. 10, fig. 2: *Aequorea globosa* n.sp.; tropical Pacific. BIGELOW 1909*a*, p. 173. MAYER 1910, p. 332: (Malayan Archipelago). STIASNY 1928*b*, p. 214: Java Sea. UCHIDA 1947*a*, p. 309: comparison with *Ae. australis.* KRAMP 1953, p. 293: comparison with *Ae. australis.*

Aequorea macrodactyla (Brandt 1835)

Up to 75 mm wide, central disk thick, lens-shaped, margin thin. Stomach about half as wide as umbrella; 60–100, up to 150 radial canals; gonads extending along almost entire length of radial canals; 10–30 (rarely up to 40) tentacles and 6–8 times as many small bulbs; tentacle bulbs broad, each with a distinct abaxial keel and with a prominent excretory papilla; statocysts very numerous.

BRANDT 1835, p. 21: as *Mesonema macrodactyla* n.sp.; tropical Pacific. BIGELOW 1909*a*, p. 174, Pl. 36: *Aequorea macrodactylum*, probably = *Ae. maldivensis* Browne 1905; eastern tropical Pacific. MAYER 1910, p. 330: as *Ae. maldivensis*, ? = *Ae. forskalea* or *macrodactyla*; p. 333: *Ae. macrodactyla.* VANHÖFFEN 1911*a*, p. 230, fig. 21: as *Mesonema coelum pensile*, in part. MAYER 1915*a*, p. 160: Torres Straits, Australia. BROWNE 1916*a*, p. 189: *Ae. macrodactyla*, = *Ae. maldivensis*, non = *Ae. pensile*; Chagos Archipelago; Saga de Malha, Indian Ocean. BIGELOW 1919, pp. 310, 313, Pl. 43, fig. 7: to Mayer's list of synonyms are added: *Polycanna pupurostoma* Agass. & Mayer 1899 and *Mesonema coelum pensile* Vanh. in part; Philippines. MENON 1932, p. 23: Madras, India. THIEL 1938*c*, p. 332, fig. 9: Great Fishbay, W. Africa. UCHIDA 1938*a*, p. 146: *Ae. macrodactyla*?; Japan. RUSSELL 1939*e*, p. 350, figs. 2*c*, *d*, 3: as *Ae. pensilis* in part; nematocysts. UCHIDA 1947*a*, p. 309: comparison with *Ae. australis.* UCHIDA 1947*b*, p. 336: Japan. KRAMP 1953, p. 294: Great Barrier Reef, Australia; p. 397: comparison with *Ae. pensilis.* RUSSELL 1953, p. 355, Pl. 33, figs. 1–5, text-figs. 220C, D, 225: as *pensilis*, in part; southern British coasts. KRAMP 1955*b*, pp. 157, 158: by Haeckel 1879 determined as *Mesonema pensile* and *macrodactylum.* KRAMP 1957*a*, pp. 38, 97, 124: variation; off Peru; southern coast of Patagonia. KRAMP 1956*b*, p. 236: Iranian Gulf. KRAMP 1958*b*, p. 361: Mergui Archipelago, Nicobars and Celerity passage, all in Indian Ocean. KRAMP 1959*a*, pp. 38, 167, 215, 227, 232, 235, 237, 270, fig. 235: West Indies; Gulf of Panama; off S.W. Africa and Angola; diagnosis; distribution.

Aequorea parva Browne 1905

6 mm wide, 4 mm high, plano-convex, jelly very thick. Stomach about 1/3 as broad as diameter of umbrella; 13–16 radial canals; gonads along middle 1/3 to 1/2 of the radial canals; 4–8 tentacles, about 12 times as many small bulbs; about as many statocysts as small bulbs; excretory pores on some of the tentacle bulbs.

12–27 mm wide, flat, thick, with vaulted apex. Stomach about half as wide as diameter of umbrella; 32 radial canals; gonads along almost entire length of the radial canals; 4–8 tentacles; about 100 small bulbs; 1–2 statocysts between successive bulbs. Excretory papillae present?

BROWNE 1905*b*, p. 146, Pl. 2, figs. 5–7: *Aequorea parva* n.sp.; Ceylon. MAYER 1910, p. 334. STIASNY 1928*b*, p. 215, figs. 3, 4: as *Ae. parva* var. *buitendijki* nov. var.; Java Sea; Singapore. MENON 1931, p. 503: Madras, India. MENON 1932, p. 24, Pl. 3, figs. 29–33: Madras, India. UCHIDA 1947*a*, p. 309: comparison with *Ae. australis*. GEORGE 1953, p. 82: Calicut, southern India. CHIU 1954*a*, pp. 41, 45, Pl. 2, figs. 7, 8: as *Ae. pensile*; Amoy, China. CHIU 1954*b*, pp. 51, 52, 55: as *Ae. pensile*; China. GANAPATI & NAGABHUSHANAM 1958, pp. 92, 94: Vizagapatam coast, India.

Aequorea pensilis (Eschscholtz 1829)

Up to 100 mm wide, central disk thick, lens-shaped, margin thin. Stomach 1/2 – 2/3 as wide as umbrella; 100–250 radial canals; gonads extending along almost entire length of radial canals; 10–16 tentacles and 8–16 times as many small bulbs; tentacle bulbs with long lateral extensions, no abaxial keel; no excretory papillae but excretory pores; statocysts very numerous.

ESCHSCHOLTZ 1829, p. 112: as *Mesonema coelum pensile*; ? Mediterranean. HAECKEL 1879, p. 226: as *Mesonema pensile*. MAYER 1910, p. 333: *Aequorea pensilis*; (Red Sea: tropical Indian Ocean; tropical Pacific). ?VANHÖFFEN 1911*a*, p. 230, fig. 21: as *M. coelum pensile* Modeer 1791; discussion of *Aequorea* and *Mesonema*; near Cape of Good Hope, South Africa; Benguela-Current; Agulhas-Current; Indian Ocean. ?VANHÖFFEN 1912, p. 371: as *M. coelum pensile*; W. of Ascension, central Atlantic; Port Natal, South Africa. BIGELOW 1913, p. 41: *Ae. pensile*; comparison with *Ae. macrodactyla*; Japan. ?VANHÖFFEN 1913*a*, p. 425, fig. C: as *M. coelum pensile*; Tortugas, Florida. ?VANHÖFFEN 1913*b*, p. 25, figs. 5, 6: as *M. coelum pensile*; W. of Galapagos Islands; Amoy and Hong Kong, China. BROWNE 1916*a*, p. 188: as *M. pensile*, non = *Ae. macrodactyla*; Chagos Archipelago, Indian Ocean. BIGELOW 1919, p. 311, Pl. 42, figs. 3, 4: *Polycanna purpurostoma* a synonym of *Ae. macrodactyla*, non = *pensile*; Philippines. MENON 1931, p. 503: *Ae. pensile*; Madras, India. MENON 1932, p. 24: *Ae. pensile*; Madras, India. DAWYDOFF 1936, p. 469: Indochina. RUSSELL 1939*e*, p. 350: as *Ae. pensilis* in part; southern British coasts. UCHIDA 1947*a*, p. 309: as *Ae. pensilis*; comparison with *Ae. australis*. NAIR 1951, p. 67: as *Ae. pensile*; variation; Trivandrum coast, India. GEORGE 1953, p. 82: as *Ae. pensile*; Calicut, southern India. KRAMP 1953, p. 295: variation and comparison with *Ae. macrodactyla*; Great Barrier Reef, Australia. RUSSELL 1953, p. 355: as *Ae. pensilis* in part. KRAMP 1956*b*, p. 236: Iranian Gulf. KRAMP 1957*a*, p. 37: comparison with *Ae. macrodactyla*. GANAPATI & NAGABHUSHANAM 1958, pp. 92, 93: Vizagapatam coast, India. KRAMP 1958*b*, p. 361: Mergui Archipelago; Orissa coast; Ganges estuary; Vizagapatam; Bay of Bengal; all localities in Indian Ocean. KRAMP 1959*a*, p. 167, fig. 236: diagnosis. RAO 1959, pp. 702–4, one fig.: with trematode larvae; Bay of Bengal.

Aequorea tenuis (A. Agassiz 1862)

80–100 mm wide, 3–4 times as wide as high, fairly thick in centre, gradually thinning towards margin. Stomach about 1/5 as wide as umbrella; 24–32 radial canals; gonads extending from stomach not quite reaching ring-canal; 48–90 tentacles and 3–4 times as many small bulbs; tentacle bulbs conical, with excretory papillae; statocysts 1–2, up to four times as many as tentacles.

A. AGASSIZ 1862, p. 361: as *Rhegmatodes tenuis* n.sp. MAYER 1910, p. 332: *Aequorea tenuis*; Massachusetts and Long Island Sound, east coast of U.S.A. BIGELOW 1914*b*, p. 19: New England, east coast of U.S.A. BIGELOW 1917, p. 303: Gulf of Maine, U.S.A. FISH 1926, p. 125: as *Rhegmatodes tenuis*; Woods Hole, U.S.A. KRAMP 1933*a*, p. 596, fig. 66: distribution. BIGELOW 1938, pp. 110–12: comparison with *Ae. floridana*. KRAMP 1959*a*, pp. 166, 211, 213, fig. 232: diagnosis; distribution.

Aequorea victoria (Murbach & Shearer 1902)

About 70 mm wide, hemispherical; with a gastric peduncle. About 100 radial canals; about same number of tentacles, numerous rudimentary bulbs; number of statocysts? Excretory papillae present. Doubtful species, probably =*Ae. aequorea.*

MURBACH & SHEARER 1902, p. 72: as *Mesonema victoria* n.sp.; Victoria Harbour, Puget Sound, British Columbia. MAAS 1905, p. 43: *Ae. victoria.* MAYER 1910, p. 330: *Ae.* '*victoria*' =*Ae. forskalea*? BIGELOW 1913, p. 38: =*Ae. forskålea.* STRONG 1925, p. 385, Pl. 38, Pl. 39, figs. 13–15, 39: development of medusa and hydroid, *Campanulina membranosa*; non-*Ae. forskålea*; Puget Sound, British Columbia. RUSSELL 1953, p. 342: =*Ae. forskalea.*

Aequorea vitrina Gosse 1853

100–170 mm wide, flatter than a hemisphere, thick in centre, gradually thinning towards margin. Stomach about half as wide as umbrella; 60–100 radial canals; gonads extending along almost whole length of radial canals; more than three times as many tentacles as radial canals and a few small bulbs; tentacle bulbs elongated, slightly laterally compressed, with excretory papillae; statocysts usually 1–2 between successive radial canals, each with 2–4 concretions.

GOSSE 1853, p. 340, Pl. 23: *Aequorea vitrina* n.sp.; England. MAYER 1910, p. 325, fig. 185: synonym of *Ae. forskalea.* KRAMP 1933*a*, p. 594, fig. 64: *Ae. vitrina*, possibly =*norvegica* Browne; English Channel; southern North Sea; west coast of Jutland; ? west coast of Norway to Lofoten. KRAMP 1937*b*, p. 118, fig. 54: Denmark. RUSSELL 1938*b*, pp. 412, 413, 416, 417: Plymouth. RUSSELL 1939*e*, p. 349, figs. 1*d*, *e*, 2*b*: nematocysts. BRAMBELL 1941, pp. 28, 29: Menai Straits, Irish Sea. CHAPMAN 1953*a*, p. 158: physiology of mesogloea; Whitstable, southern England. RUSSELL 1953, p. 350, Pl. 21, figs. 2, 4, 5, Pl. 32, fig. 3, text-figs. 220B, 222–4: British coasts. NEWELL 1954, p. 330: Kent, England. SOUTHWARD 1954, p. 19: as *Aequorea* sp.; Irish Sea. KRAMP 1959*a*, pp. 166, 215, 216, 218, 222, fig. 233: diagnosis; distribution.

Aequorea sp. Menon 1945

MENON 1945, p. 41: *Aequorea* sp.; Trivandrum coast, India.

Genus **Rhacostoma** L. Agassiz 1850

Aequoreidae with numerous simple radial canals. Subumbrella with radial rows of gelatinous papillae.

Type-species: *R. atlanticum* L. Agassiz.

L. AGASSIZ 1850, p. 342: *Rhacostoma* n.g. HAECKEL 1879, p. 231: as *Polycanna*, subgenus *Zygodactyla*. MAYER 1910, p. 335: as *Zygodactyla* in part. KRAMP 1942, p. 68: *Rhacostoma* a valid genus.

Rhacostoma atlanticum L. Agassiz 1850

Up to 300–400 mm wide, 3–4 times as wide as high, thick in centre. Stomach 1/3 – 1/2 as wide as umbrella; 80–100 radial canals; gonads extending along greater part of radial canals, leaving both ends free; tentacles slightly more numerous than radial canals; tentacle bulbs elongated conical; excretory papillae present; numerous statocysts.

L. AGASSIZ 1850, p. 342: *Rhacostoma atlanticum* n.g., n.sp.; Gulf of Maine and Massachusetts Bay, U.S.A. MAYER 1910, p. 335, Pl. 44, figs. 1–4: as synonym of *Zygodactyla groenlandica* L. Agassiz 1862; (along east coast of North America from North Carolina to Gulf of Maine); (Greenland, erroneous). BIGELOW 1914*b*, p. 19: as *Aequorea groenlandica*; New England, east coast of U.S.A. BIGELOW 1915*b*, pp. 314, 316, 318, 319: as *Ae. groenlandica*; New England, between New York and Chesapeake Bay. BIGELOW 1919, p. 309: discussion; *Zygodactyla* is united with *Aequorea*. KRAMP 1919, p. 107: as *Z. groenlandica*. BIGELOW 1922, p. 159: as *Ae. groenlandica*; off Chesapeake Bay, U.S.A. FISH 1926, p. 124: as *Z. groenlandica*; Woods Hole, U.S.A. THIEL 1932*a*, p. 148: as *Z. groenlandica*, in part. THIEL 1932*b*, pp. 443 ff.: as *Z. groenlandica*, in part; distribution. BOONE 1933, p. 28, Pl. 1: as *Z. groenlandica*; Eastport, Maine, U.S.A. KRAMP 1933*a*, p. 596, figs. 67, 68: as *Z. groenlandica*; distribution. KRAMP 1942, p. 68: the medusa ought to be called *Rhacostoma atlanticum* (or *Ae. atlanticum*), non = *Ae. groenlandica* Péron & Lesueur. KRAMP 1947, p. 56: *R. atlanticum*. RANSON 1949, p. 129: as *Ae. groenlandicum*; Cabo la Vela, Colombia. KRAMP 1955*a*, p. 266: Senegal, W. Africa. KRAMP 1959*a*, pp. 168, 211, 212, 214, 227, 231, 265, 266, fig. 237: diagnosis; distribution. KRAMP 1959*b*, p. 9: off Congo, W. Africa.

Genus **Zygocanna** Haeckel 1879

Aequoreidae with numerous radial canals, bifurcated or branched. Subumbrella sometimes with radial rows of gelatinous papillae.

Type-species: *Z. pleuronota* (Péron & Lesueur).

HAECKEL 1879, p. 214: *Zygocanna* n.g. MAYER 1910, p. 337: *Zygocanna*, incl. *Zygocannota* Haeckel. BIGELOW 1919, p. 314: *Zygocanna* + *Zygocannota* + *Zygocannula*; discussion of species.

Zygocanna buitendijki Stiasny 1928

Up to 33 mm wide, about 10 mm high, exumbrella with 70–100 radial ribs containing hollow tubes; no subumbrellar papillae between radial canals.

Stomach about half as broad as diameter of umbrella; radial canals divided into 3–6 branches, 80–100 reaching ring canal; 16–18 large tentacles and as many small ones or bulbs; about 200 statocysts; excretory papillae present.

STIASNY 1928*b*, p. 218, figs. 5*a–e*, 6, 7: *Zygocanna buitendijki* n.sp.; Java Sea. MENON 1932, p. 25, Pl. 3, figs. 34, 35: Madras, India. GANAPATI & NAGABHUSHANAM 1958, pp. 92, 94: Vizagapatam coast, India. KRAMP 1958*b*, p. 363: Mergui Archipelago, Indian Ocean.

Zygocanna diploconus (Haeckel 1879)

60–100 mm wide, higher than a hemisphere, exumbrella with numerous radial ridges. Stomach on large, conical, gelatinous peduncle; 25–35 radial canals, bifurcated; 50–70 long tentacles; 200–300 statocysts; excretory papillae? Colour rose red.

HAECKEL 1879, p. 216, Pl. 15, fig. 6: as *Zygocannula diploconus* n.g., n.sp.; Sunda Strait, Indian Ocean. MAYER 1910, p. 339, fig. 196: as *Zygocannula*, incl. *Z. undulosa* Haeckel.

Zygocanna pleuronata (Péron & Lesueur 1809)

20–30 mm wide, 8–10 mm high, disk-shaped; exumbrella with 40–50 radial ribs. Stomach cylindrical; 16–20 radial canals, bifurcated; 10–16 tentacles; statocysts?

PÉRON & LESUEUR 1809, p. 338: as *Aequorea pleuronota* n.sp; north coast of Australia. HAECKEL 1879, p. 214: as *Zygocanna pleuronota*; p. 215, Pl. 15, figs. 7, 8: as *Z. costata*. MAYER 1910, p. 338, fig. 195: *Z. pleuronota* + *Z. costata* Haeckel; (New Guinea).

Zygocanna purpurea (Péron & Lesueur 1809)

80–100 mm wide, 10–16 mm high. Stomach 1/4 as broad as diameter of umbrella, cylindrical; 12 radial canals, bifurcated; gonads each forming a cluster of five parallel, serrated lamellae; tentacles very numerous; statocysts? Colour: violet-purple.

PÉRON & LESUEUR 1809, p. 337: as *Ae. purpurea* n.sp.; west coast of Australia. MAYER 1910, p. 338: *Zygocanna purpurea*.

Zygocanna vagans Bigelow 1912

Up to 76 mm wide, flat, thin; subumbrella with radial rows of gelatinous papillae. Stomach 1/3 – 1/2 as wide as umbrella; about 30–45 radial canals leave the periphery of the stomach without branching, but from a cruciform figure in centre of stomach branching grooves pass to the points of origin of the free canals; gonads extending along greater portion of radial canals; 28–70 tentacles and several small bulbs, with long excretory papillae; statocysts very numerous.

Bigelow 1912, p. 255: *Zygocanna vagans* n.sp.; Philippines. =*Aequorea*? sp. juv. Maas 1905 from Malay Archipelago. Bigelow 1919, p. 315, Pl. 42, figs. 5–7, Pl. 43, fig. 6: Philippines. Bigelow 1940, p. 299, fig. 14: Pacific Ocean off Panama and Colombia. Kramp 1957*a*, pp. 40, 97, 105, 124: W. of Cape of Good Hope, S. Africa. Kramp 1959*a*, pp. 39, 168, 222, 223, 227, 230, 270, figs. 7, 238: near the Azores; diagnosis; distribution.

Zygocanna sp. Menon 1931

Menon 1931, p. 503: *Zygocanna* sp.; Madras, India.

Zygocanna sp. Menon 1945

Menon 1945 p. 41: *Zygocanna* sp.; Trivandrum coast, India.

Zygocanna sp. Babnik 1948

Babnik 1948, p. 40: *Zygocanna* sp.; Adriatic Sea.

Order LIMNOMEDUSAE

Hydrozoa with alternating generations. The sexual generation is a velar medusa with hollow tentacles; the gonads either on the stomach wall with or without perradial lobes extending along the radial canals, or on the radial canals only; if statocysts are present, they are internal and provided with an endodermal axis. The asexual generation is a sessile polyp with power of vegetative propagation, with or without tentacles; the endoderm of the tentacles in direct connection with that of the gastral cavity.

Family *MOERISIIDAE*

Limnomedusae usually without marginal vesicles; with gonads on the stomach wall and in radial lobes of stomach extending outwards along the radial canals; with four simple, unbranched radial canals; tentacle bulbs with abaxial ocelli. Hydroids, where known, small, with hollow tentacles.

Genus ***Halmomises*** von Kennel 1891

Moerisiidae with radial lobes of stomach with twisted and folded gonads; tentacles with rings of nematocysts. Polyp unknown.

Type-species: *H. lacustris* v. Kennel.

von Kennel 1891, p. 282: *Halmomises* n.g.

Halmomises lacustris von Kennel 1891

2–2·5 mm wide, slightly higher than a hemisphere; stomach powerful, cross-shaped in section; no oral lips; radial lobes with twisted and folded gonad extending along proximal 3/4 of the length of radial canals; 16–18 very long and fine tentacles, with rings of nematocysts throughout their length.

von Kennel 1891, pp. 282–8: *Halmomises* n.g., n.sp.; fresh-water lagoon on E. coast of Trinidad, S. America. Mayer 1910, p. 199: as *Thaumantias lacustris*. Valkanov 1936, pp. 301, 302, 333: *H. lacustris* is referred to Moerisiidae. Kramp 1938*b*, p. 53: remarks. Valkanov 1938, p. 312. Picard 1951*d*, p. 5: *Halmomises* =*Moerisia*. Kramp 1959*a*, pp. 169, 233: diagnosis.

Genus ***Moerisia*** Boulenger 1908 *

Moerisiidae with four or more tentacles with rings of nematocysts throughout their length; bulbs globular, not clasping exumbrellar margin; stomach cruciform, without a peduncle; mouth without distinct lips; gonads on radial canals continuous with those on the stomach walls, smooth.

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* See Addenda, p. 445

Polyp with filiform tentacles in one more or less distinct whorl; with a thin perisarc.

Type-species: *M. lyonsi* Boulenger.

BOULENGER 1908, p. 357: *Moerisia* n.g. PICARD 1951*d*, p. 5: *Moerisia* = *Halmomises*.

Moerisia gangetica Kramp 1958

3 mm wide, 2 mm high, globular, jelly very thick; stomach very small, mouth-opening cross-shaped without lips, radial lobes nearly extending to ring-canal, distal parts sac-like, pendent; 19 tentacles of equal size, with semiglobular basal bulbs, each with an abaxial red ocellus; nematocysts in rings along whole length of tentacle. Polyp unknown.

KRAMP 1958*b*, p. 363, figs. 5*a*, *b*: *Moerisia gangetica* n.sp. (? = *M. lyonsi*); near Calcutta, India. KRAMP 1959*a*, p. 170: diagnosis.

Moerisia lyonsi Boulenger 1908

4·5 mm wide, 4 mm high, globular, very thick; stomach cylindrical, mouth round, no lips; radial lobes 2/3 of radial canals, smooth; usually four tentacles, sometimes 16, rarely up to 22, long, with prominent rings of nematocysts. Polyp colonial.

BOULENGER 1908, pp. 357–78, Pl. 22, 23: *Moerisia lyonsi* n.g., n.sp.; Lake Qurun, Egypt. BOULENGER 1910, p. 763: nematocysts. MAYER 1910, p. 488. BOULENGER 1911*b*, pp. 1045–56, Pl. 59: variation. HARTLAUB 1913, pp. 237, 238: *Moerisia lyonsi*, transition form from *Podocoryne* to Tiaridae. KÜHN 1913, pp. 47, 77. HARTLAUB 1917, p. 417, fig. 347. OSTROUMOWA 1925, p. 282: diagnosis. HADŽI 1928, p. 38. VALKANOV 1936, p. 301. KRAMP 1938*a*, pp. 105, 106: remarks. KRAMP 1938*b*, p. 53. VALKANOV 1938, p. 308, figs. 3*b*, 6, 14: medusa; figs. 19, 22, 27, 30, 33, 34, Pl. fig. A: hydroid; fig. 29, I: cnidome. VALKANOV 1949*a*, pp. 187–92: polyp, not budding. PICARD 1951*d*, p. 5: as *Halmomises lyonsi*. REES 1957*b*, p. 445: family *Moerisiidae* referred to sub-order Capitata, among the Anthomedusae. REES 1958, pp. 537 ff., text-figs. 1, 2, 3*a*, 4: a new super-family of Capitata, Moerisioidea, is established. KRAMP 1959*a*, p. 170, fig. 239: diagnosis.

Moerisia pallasi (Derzhavin 1912)

3 mm wide, 3·5 mm high, dome-shaped, jelly thick; stomach short, cruciform, mouth with four slightly indicated lips, radial lobes about 2/3 the length of radial canals; up to 32 tentacles of different lengths in regular succession according to age. Polyp with 10–15 scattered tentacles, mainly pelagic.

BOULENGER 1912*a*, p. 58: discussion of systematic position; is referred to *Moerisia*. DERZHAVIN 1912*a*, pp. 390–6, figs. 1–5: as *Caspionema pallasi* n.g., n.sp.; northern Caspian Sea. DERZHAVIN 1912*b*, pp. 1–14: agrees with Boulenger. POCHE 1914, p. 66: *Caspionema* is a valid genus. OSTROUMOVA 1925, p. 283: diagnosis. HADŽI 1928, p. 38: as *C. pallasi*; report. WEISSIG 1928, pp. 249–51: Caspian Sea. VAL-

Kanov 1936, p. 301: as *C. pallasi*. Kramp 1938*a*, pp. 105, 106: as *C. pallasi*; remarks. Kramp 1938*b*, p. 53: as *C. pallasi*. Valkanov 1938, p. 311, figs. 3*a*, 7, 15: as *C. pallasi*. Picard 1951*d*, p. 5: as *Halmomises pallasi*. Kramp 1959*a*, p. 170, fig. 240: diagnosis.

Genus **Odessia** Paspaleff 1937

Moerisiidae with tentacles with nematocysts in transverse clasps, not in rings; basal bulbs globular, not clasping umbrella margin; stomach cruciform, without a peduncle.

Type-species: *O. maeotica* (Ostroumoff).

Paspaleff 1937, p. 112: *Odessia* n.g.

Odessia maeotica (Ostroumoff 1896)

Up to 18 mm wide, usually much smaller, about as high as wide or somewhat lower, bell-shaped, thick; radial lobes of stomach along proximal half or more of radial canals; in the adult medusa the gonads on the radial canals are separated from those in the stomach walls; 16–32 tentacles.

O. maeotica typica. Up to 18 mm wide
O. maeotica ostroumovi (Paspaleff): 5–6 mm wide
O. maeotica gallica (Hartlaub): 5–8 mm wide
O. maeotica marina Picard: 4–6 mm wide

Ostroumoff 1896, p. 401, Pl. 1, figs. 2, 4, 5: as *Thaumantias maeotica* n.sp.; Sea of Azov. Mayer 1910, p. 200, fig. 103: as *Th. maeotica*; new record: Naples, Italy. Hartlaub 1913, pp. 238, 247, 248, figs. 200, 203: as *Moerisia pallasi*; presumes that *Th. maeotica* = *M. pallasi*; Cette, South France. Neppi & Stiasny 1913*b*, p. 36, Pl. 3, fig. 26: as *Th. hemisphaerica*; Trieste, Adriatic Sea. Hartlaub 1917, p. 417: the specimens from Cette belong to *M. gallica* n.sp. Knipowitsch 1925, p. 18: as *Th. maeotica*. Borcea 1928, pp. 643, 652–5: as *Th. maeotica*; coast of Rumania. Hadži 1928, p. 38: probably belongs to *Ostroumovia*. Paspaleff 1934, pp. 273–80, figs. 1–4: as *Th. maeothica*; Bay of Varna, Bulgaria. Valkanov 1934, p. 21: as *Th. maeotica*; Mandra swamps, Bulgaria. Thiel 1935*c*, p. 167: *Th. maeotica* belongs to Leptomedusae; occurrence in Black Sea. Valkanov 1935, p. 288, Pl. figs. 3, 4, 5, fig. J: as *Th. maeotica*, belongs to Anthomedusae; p. 289, Pl. figs. 8–13: the polyp *Ostroumovia inkermanica*; Bulgaria. Paspaleff 1936, pp. 1–34, 1 Pl., 29 figs.: as *Pontia ostroumovi* n.g., n.sp.; Bulgaria. Valkanov 1936, pp. 292, 333, figs. 24, 25*a*, *b*, *c*, *f*, *g*, 26*a*, *b*, *c*: '*Thaumantias*' *maeotica* *Ostroumovia inkermanica*. Paspaleff 1937, p. 112: *Odessia maeotica* n.g. Kramp 1938*b*, p. 53: as *M. gallica*; remarks. Valkanov 1938, p. 308: as *M. gallica*; p. 309, figs. 1, 4, 9, 10, 12*b*, 16, 17, 29v: as *Ostroumovia maeotica*. Valkanov 1949*b*, pp. 193–200, figs. 1–5: *M. gallica* = *Ostroumovia maeotica*; Aegean Sea. Picard 1951*a*, p. 528: as *Odessia maeotica* forma *galiica*; French Mediterranean coast, and Casablanca, Morocco. Picard 1951*d*, pp. 6–11, 7 figs.: only one species of *Odessia* with four formae: *O.m. maeotica*; Sea of Azov; *O.m. ostroumovi*; Bulgaria and Odessa, Black Sea; *O.m. marina* nov.; Naples; Trieste; Casablanca; *O.m. gallica*; Mediterranean coast of France.

Picard 1952*a*, p. 55: *O.m.* forma *gallica*; description of original material. Picard 1955*b*, pp. 91–3: new localities on Mediterranean coast of France. Valkanov 1957, p. 17: as *Ostroumovia maeotica*. Rees 1958, p. 540, text-fig. 5: *O.m.* forma *gallica*. Kramp 1959*a*, pp. 171, 223, 225, fig. 242: diagnosis; distribution.

Genus **Ostroumovia** Hadži 1928

Moerisiidae with small internal statocysts. Stomach without a peduncle, cruciform with long perradial lobes; mouth cruciform without distinct lips; with gonads on radial lobes continuous with those in the stomach walls. With tentacles with rings of nematocysts throughout their length, basal part of tentacles adnate to exumbrella. Polyp sessile, with scattered moniliform tentacles.

Type-species: *O. inkermanica* (Paltschikowa-Ostroumova).

Hadži 1928, p. 39: *Ostroumovia* n.g.

Ostroumovia inkermanica (Paltschikowa-Ostroumova 1925)

Up to 6·5 mm wide and 5·5 mm high, dome-shaped, jelly very thick; stomach very small, prismatic, with radial lobes extending nearly to bell margin; gonads on radial lobes with distal portions sac-like pendent; up to 32 tentacles of different lengths, proximal part of tentacles narrow, adnate to exumbrella, with an ocellus at the point of issue of the free part of the tentacles; internal statocysts very small, almost invisible except in microtome sections.

Schmankewitsch 1874, p. 276: as *Thaumantias* sp.; Odessa. Paltschikowa-Ostroumova 1925, pp. 273–84, figs. 1–3: as *Moerisia inkermanica* n.sp.; Sevastopol, Black Sea. Hadži 1928, p. 39: *Ostroumovia inkermanica* n.g. Thiel 1935*c*, p. 167: as *Thaumantias maeotica*; discussion; Black Sea. Valkanov 1935, pp. 277, 289, figs. 8, 9: *O. inkermanica* the polyp of *Thaumantias maeotica*; Varna, Mandra- and Ojavolsco swamps, all localities at the coast of Black Sea; pp. 275, 288, fig. 7: the medusa belongs to Anthomedusae; Mandra swamps. Paspaleff 1936, pp. 1–34: *M. inkermanica* is not the polyp of *T. maeotica*. Valkanov 1936, pp. 292–301, figs. 20–7: description. Kramp 1938*a*, pp. 103–8, fig. 1: belongs to new suborder Limnomedusae. Kramp 1938*b*, pp. 45–60, Pl. figs. 1–6, text-figs. 1–5: Bulgaria. Paspaleff 1938*b*, pp. 29–40, figs. 1–15: Bulgaria. Valkanov 1938, p. 309, figs. 2, 5, 8, 11, 12*a*, 13, 41 (medusa); 18, 23, 25, 28, 37–40, Pl. fig. B (polyp); 29 IV (cnidome). Valkanov 1949*a*, pp. 187–92, figs. 1–3 (polyp): Bulgaria. Picard 1951*d*, p. 7. Valkanov 1953, p. 45: is referred to Moerisiidae. Brattström 1954, pp. 21, 22, 24: Bulgaria. Kramp 1958*b*, p. 364: Vizagapatam Channel, India. Valkanov 1957, p. 17: as *O. inkermanica* and *maeotica*; Black Sea. Rees 1958, pp. 540 ff. Kramp 1959*a*, p. 171, fig. 243: diagnosis; remarks.

Genus **Tiaricodon** Browne 1902

Moerisiidae with four perradial tentacles; stomach with four perradial lobes extending along a broad, gelatinous peduncle; mouth with four distinct lips.

Type-species: *T. coeruleus* Browne.

BROWNE 1902, p. 276: *Tiaricodon* n.g.

Tiaricodon coeruleus Browne 1902

24 mm wide, 25 mm high, jelly thick, bell-shaped; stomach nearly to velar level, four lips distinct, crenulated; radial lobes sac-like, on peduncle only; four perradial tentacles, stout, tapering, nematocysts in proximal part in small, rounded warts, in middle part forming transversal clasps, in distal part rings; an abaxial ocellus. Polyp unknown.

BROWNE 1902, p. 276: *Tiaricodon coeruleus* n.g., n.sp.; Falkland Islands, South Atlantic Ocean. MAYER 1910, p. 73: as *Corynitis* (?) *coerulea*. VANHÖFFEN 1913*b*, p. 6, Pl. 1, fig. 2, Pl. 2, figs. 2–6: *T. caeruleus*; Callao, E. Pacific Ocean; Strait of Magellan, South Chile. BROWNE & KRAMP 1939, p. 311, Pl. 18, figs. 1–6, Pl. 19, figs. 8–11; belongs to Moerisiidae; Falkland Islands. KRAMP 1948*a*, p. 6: Weddell Sea, Antarctic. KRAMP 1957*a*, pp. 41, 96, 124: Falkland Islands. KRAMP 1959*a*, pp. 170, 235, 237, 269, fig. 241: diagnosis; distribution.

Family *OLINDIADIDAE*

Limnomedusae with internal marginal vesicles; with gonads on the radial canals; with simple, unbranched radial canals; without ocelli. Polyps, where known, very small, with or without tentacles.

Genus ***Aglauropsis*** Fr. Müller 1865

Olindiadidae with four radial canals and without centripetal canals; with numerous enclosed marginal statocysts; numerous tentacles of one kind without adhesive pads, not arranged in groups.

Type-species: *A. agassizi* Fr. Müller.

MÜLLER 1865, p. 143: *Aglauropsis* n.g. BROWNE 1902, p. 274: generic name retained for a new species, *A. conanti*. MAYER 1910, p. 362.

Aglauropsis agassizi Fr. Müller 1865

There exists no adequate description; 2–4 mm wide, highly vaulted.

MÜLLER 1865, p. 144, Pl. 7, fig. 4 (statocyst): *Aglauropsis agassizi* n.g., n.sp.; coast of Brazil. HAECKEL 1879, p. 250: referred to Petasidae. MAYER 1910, p. 362: systematic position uncertain. VANNUCCI 1951*b*, p. 106: reference to Mayer. KRAMP 1959*a*, pp. 175.

Aglauropsis conanti Browne 1902

Up to 22 mm wide, about 15 mm high; bowl-shaped, jelly thick and solid; stomach fairly long, mouth with four large folded lips with a band of nematocysts; radial canals broad; gonads extending along nearly whole length of radial canals, transversely lobed; about 200 tentacles, closely packed; 50 or more statocysts.

BROWNE 1902, p. 283: *Aglauropsis conanti* n.sp.; Falkland Islands. MAYER 1910, p. 362: belongs to family Olindidae, subfamily Petasinae. BROWNE & KRAMP 1939, p. 314, Pl. 18, figs. 7–16: Falkland Islands. KRAMP 1957*a*, pp. 42, 96, 124: Strait of Magellan; Falkland Islands. KRAMP 1959*a*, pp. 176, 235, fig. 251: diagnosis; distribution.

Aglauropsis jarli Kramp 1955

4 mm high and wide, jelly moderately thick; stomach very small; no distinct lips; radial canals narrow; gonads on distal half of radial canals, smooth, distal end pendent; eight long perradial and interradial tentacles and 16 small, partly almost rudimentary tentacles; 24 statocysts; all tentacles with rings of nematocysts.

KRAMP 1955*a*, p. 267, Pl. 3, fig. 6: *Aglauropsis jarli* n.sp.; off Liberia, W. Africa. KRAMP 1959*a*, pp. 176, 227, fig. 252: diagnosis; distribution.

Genus ***Craspedacusta*** Lankester 1880

Olindiadidae without peduncle; with four simple radial canals; without centripetal canals; with pendent pouch-like gonads only on radial canals; with evenly distributed marginal tentacles all of one kind, without organs of adhesion; with statocysts in enclosed vesicles in velum.

Type-species: *C. sowerbyi* Lankester.

LANKESTER 1880, p. 147: *Craspedacusta* n.g. ALLMAN 1880, p. 178: as *Limnocodium* n.g. POTTS 1885, p. V: as *Microhydra* n.g., hydroid. MAYER 1910, p. 363: *Craspedacusta* has priority over *Limnocodium*.

Craspedacusta iseana (Oka & Hara 1922)

Up to 18 mm wide, disk-shaped; 128 tentacles in six series; same number of statocysts which are regularly spherical; nematocysts not in warts or papillae but scattered directly over the surface of the tentacles.

OKA & HARA 1922, pp. 87–9, text-figs. 1, 2: as *Limnocodium iseanum* n.sp.; Tsu, central Japan. OKA 1922, pp. 198–200: as *L. iseanum*; report of Oka & Hara. UCHIDA 1929*a*, p. 369, Pl. 1, fig. 11: *Craspedacusta iseana*; Japan. KRAMP 1950, p. 177: *C. iseana* probably a distinct species, but now extinct. UCHIDA 1955*b*, pp. 117–20, text-figs. 2–5: comparison between *Cr. sowerbyi* and *iseana*, the latter being clearly distinct from the former.

Craspedacusta sinensis Gaw & Kung 1939

Up to 18 mm wide; differs from *C. sowerbyi* in the following points: perradial tentacles not remarkably longer than the others; nematocysts situated in elongated cylindrical or club-shaped papillae which are scattered irregularly over the tentacles.

Gaw & Kung 1939*a*, p. 299: no name; Kiating, China. Gaw & Kung 1939*c*, pp. 1–8, text-figs. 1–3; as *C. sinensis* n.sp.; Kiating, China. Kramp 1950, pp. 172–82, Pl. 2, figs. 1–3, text-figs. 5–7: new description; China.

Craspedacusta sowerbyi Lankester 1880

Up to about 20 mm wide, slightly flatter than a hemisphere; stomach large with broad base, tapering towards distal region; mouth with four slightly folded lips; gonads large, smooth, distal portion pouch-like; up to about 400 tentacles in several series, the four perradial tentacles much larger than any of the others; nematocysts in low warts which are arranged in more or less distinct rings round the tentacles; statocysts about half number of tentacles.

Lankester 1880, pp. 147, 177, 190, 241: *Craspedacusta sowerbii* n.g., n.sp.; Regents Park, London. Allman 1880, pp. 178, 218, 290: as *Limnocodium victoria* n.g., n.sp. Potts 1885 (cover sheets): description of the hydroid *Microhydra ryderi* n.g., n.sp.; Pennsylvania, U.S.A. Ryder 1885, pp. 1232 ff.: description of the medusa of *M. ryderi*; as *Pottsia ryderi*. Potts 1897, pp. 130–3: as *M. ryderi*, probably =*C. sowerbii*. Oka 1907, p. 219, Pl. 8, three figs.: as *L. kawaii* n.sp.; China. Mayer 1910, p. 363, fig. 207: *C. sowerbii*, belongs to Trachymedusae, family Petasidae; probably introduced from South America or West Indies to N. America and Europe; p. 365: as *C. kawaii* (Oka 1907), probably =*C. sowerbii*; p. 366, figs. 208, 209: as *M. ryderi*; (Philadelphia, U.S.A.). Schorn 1911, pp. 365, 366: as *M. ryderi*; Eberswalde, Germany. Douglas 1912, pp. 92–110, Pl. 1: as *L. sowerbyi*; systematic position. Garman 1916, pp. 858–60: Kentucky, U.S.A. Pélosse 1918, pp. 53–62, three figs.: as *L. sowerbyi*; Lyon, France. Hargitt 1919, pp. 413–15: *Craspedacusta* sp.; Indiana, U.S.A. Goette 1920, pp. 71–7, figs. 1–8: as *M. ryderi*; asexual reproduction. Hecht 1921. Alt 1922: as *M. ryderi*; Frankfurt, Germany. Garman 1922, p. 664: Kentucky, U.S.A. Alt 1923: as *M. ryderi*; Germany. Geidies 1923: as *M. ryderi*; Germany. Hargitt 1923, pp. 478–80: as *L. sowerbii*; U.S.A. Backhoff 1924, p. 194: as *M. ryderi*; Stettin, Germany. Garman 1924, pp. 477–8: Kentucky, U.S.A. Heinzel 1924: as *M. germanica* Roch 1924; Graz, Austria. Miller 1924, pp. 52–5. Payne 1924, pp. 387–430, 10 Pls.: as *C. ryderi*. Roch 1924*a*, pp. 131–6, figs. 1, 2: as *M. germanica* n.sp.; Berlin. Roch 1924*b*: as *M. germanica*. Payne 1925, p. 421: as *C. ryderi* (hydroid); Kentucky. Smith 1925, pp. 588–9: as *C. ryderi*; Panama Canal Zone. Payne 1926, pp. 433–43, figs.: as *C. ryderi*; life history; U.S.A. Roch 1926: as *Microhydra germanica*; Germany. Schmitt 1927, pp. 591–2: Washington, U.S.A. Boulenger & Flower 1928, p. 1005, Pl. 1, figs. 1, 2: *C. sowerbii* =*C.(Microhydra) ryderi*; Birmingham, England. Breder 1928, p. 242: New York, U.S.A. Flower & Lockyer 1928, p. 58: as *L. sowerbyi*. Maske 1928, pp. 767–9: as *M. ryderi*; Poznan, Poland. Sowerby 1928*a*, pp. 253–5: as *L. sowerbii*. Sowerby 1928*b*, pp. 313–14: as *L. sowerbii*. Hickson 1929, p. 50: as *M. ryderi*; Boscombe, England. Totton 1929, p. 912: Regents Park, London. White 1929, p. 246. Amemiya 1930, p. 3: as *M. ryderi*; Tokyo. Feytaud & Cadenat 1930. Gliesch 1930, pp. 145–8: as *Microhydra* sp.; Porto Allegre, Brazil.

Lovegren 1930, pp. 113, 114. Moser 1930, pp. 283–303, four Pls.: discussion of species of *Microhydra*; Hamburg, Germany. Vallentin 1930, pp. 15, 16: as *C.* (*Limnocodium*) *sowerbii*; Exeter, England. White 1930, pp. 222–32, 16 figs.: as *C. ryderi*; development; Alabama, U.S.A. Graupner 1931, pp. 11–14, figs. 1, 2: comparison between *M. ryderi* and *germanica*. Ortenburger & Phillips 1931, p. 222: as *C. ryderi*; Oklahoma, U.S.A. Redeke & Vos 1931, pp. 328–30, one fig.: as *M. germanica*; Holland. Baird 1932, pp. 323–4: *Craspedacusta*; Ohio, U.S.A. Bennitt 1932, pp. 287–8: previous records from U.S.A.; Missouri. Brooks 1932, p. 465: as *C. ryderi*; Pennsylvania, U.S.A. Dejdar 1932, p. 758: as *C. sowerbii*; Czechoslovakia; preliminary account. Fujiwara 1932, pp. 155–68, four figs.: =*C. sowerbyi* var. *kawaii*; China. Garner & Markle 1932, pp. 431–2: as *C. ryderi*; Indiana, U.S.A. Haas 1932, pp. 316–17, one Pl.: Frankfurt-am-Main, Germany. Sybrandi 1932*a*, pp. 81, 82: as *C. sowerbii* and *L. sowerbii*; Haarlem, Holland. Sybrandi 1932*b*, p. 194. Sybrandi 1932*c*. Allyn 1933, pp. 259–60, one fig.: as *C. ryderi*; Indiana, U.S.A. Kraatz 1933*a*, pp. 87–8: as *C. ryderi*; Ohio, U.S.A. Kraatz 1933*b*, p. 308: as *C. ryderi*; Ohio, U.S.A. Moser 1933, pp. 590–2: anatomy of female gonads. Persch 1933, pp. 163–210, figs. 1–55: as *M. germanica*. Someren 1933, p. 315: Scotland. Tattersall 1933, p. 570: Monmouthshire, England. Tschernowskij 1933, pp. 205–9, two figs.: Alt-Buchara, south of Lake Aral. Uchida & Kimura 1933, pp. 123–6, one fig.: as *C. sowerbyi* var. *kawaii*; China. Woodhead 1933, p. 479: Michigan, U.S.A. Cheatum 1934, p. 528: as *C. ryderi*; Texas, U.S.A. Dejdar 1934, pp. 595–691, figs. 1–41: anatomy and histology of polyp and medusa; distribution; survey of literature. Feytaud 1934, pp. 242–5, two figs. Germain 1934, pp. 85, 86: river Mayenne, France. Joseph 1934, p. 37: belongs to Trachymedusae. Reisinger 1934, p. 33: rivers Rhein and Maas, Germany. Robertson 1934, p. 403: Buffalo, U.S.A. Sybrandi 1934, pp. 250–8: Holland. Uchida 1934*a*: Japan. Jenkins 1935, pp. 39–45: Monmouthshire, England. Aitken 1936, p. 186: Iowa, U.S.A. Germain 1936, pp. 70–7, three figs.: France. Hummelinck 1936, pp. 308–16, 15 figs.: survey of records in Holland. Liang 1936, pp. 1–3. Miethke & Ulrich 1936, pp. 214–18: Berlin, Germany. Perrier 1936, p. 118, fig.: as *C. soverbyi* (misprint); France. Roxas 1936, pp. 37–41: as *C. kawaii*; Manila, Philippines. Schreitmüller 1936, pp. 84–5, seven figs. Tang, Yang & Fang 1936, pp. 445–52: probably a new subspecies of *Craspedacusta*; Amoy, China. Van Cleave 1936, p. 443: Illinois, U.S.A. Viosca & Burkenroad 1936, pp. 155–6: Louisiana, U.S.A. Atwood & Steyermark 1937, p. 280: Missouri, U.S.A. Breder 1937, pp. 182–6, two figs.: as *Craspedacusta ryderi*. Hamaker & Milne 1937, p. 494: as *C. ryderi*; Virginia, U.S.A. Harbaugh 1937, p. 116: Kansas, U.S.A. Kimura 1937, pp. 319–42, Pl. 23, five figs. Kramp 1937*b*, p. 124, figs. 56, 57: Denmark. Quick & Matthews 1937, p. 561: as *C. ryderi*; Pennsylvania, U.S.A. Steagall 1937, pp. 317–19: Illinois, U.S.A. Causey 1938, p. 13: as *C. ryderi*; Arkansas, U.S.A. Fantham & Porter 1938, pp. 515–16: eastern Canada. Hummelinck 1938, pp. 333–6, one fig.: as *C. marginata* (Modeer) nom. nov.; Holland. Kuster 1938, p. 300: as *C. ryderi*; Pennsylvania, U.S.A. Milne 1938, pp. 464–72: as *Craspedacusta* sp.; U.S.A. Powers 1938, p. 498: as *C. ryderi*; Tennessee, U.S.A. Stoner 1938, pp. 188–9: as *Craspedacusta*; Albany, U.S.A. Damas 1939, p. 298, fig. 1: Meuse, Belgium. Fuhrmann 1939, p. 363: (polyp); Switzerland. Kung & Gaw 1939, pp. 1–12, text-figs. 2a, b, c, 3a, b: as *C. sowerbii* var. *kiatingi* nov. var.; Kiating, China. Gaw & Kung 1939*b*, pp. 1–11: as *C. sowerbii* var. *kiatingi*; physiology. Gaw & Kung 1939*c*, pp. 1–8: comparison with *C. sinensis*. Hummelinck 1939, pp. 1–3: as *C. marginata*; Holland. Middelhock 1939, pp. 18–20, figs. Schmitt 1939, pp.

83–9: records since 1932 in U.S.A. Shadle & Minthorn 1939, pp. 254–5: western New York, U.S.A. Auken 1940, pp. 95–6: as *C. ryderi*; New York, U.S.A. Chen 1940, pp. 70, 71: as fresh-water medusa, not determined; Kwangtung, China. Edmondson 1940, pp. 313, 314: Hawaii, Pacific Ocean. Herklots 1940, p. 70: Hong Kong, China. Kugler 1940, p. 250: southern Germany. Reese 1940, p. 180: as *Craspedacusta*; U.S.A. Zeliff 1940, pp. 251, 252: New Jersey, U.S.A. Hummelinck 1941, pp. 9–17, figs. 1–7: as *Maeotias marginata*; description of specimens, previously described as *C. marginata* Hummelinck 1938 and 1939, now referred to *Maeotias*. Martins 1941, pp. 227–30: Minos Gerais, Brazil. Sowerby 1941, pp. 186–9: discussion of origin; China. Dunham 1942*a* pp. 57–62: ecology and physiology. Dunham 1942*b*, p. 526: water content. Porter & Schmitt 1942, p. 515: South America. Tomita 1942, pp. 167–73: influence of pH on *C. sowerbyi*. Deewey & Brooks 1943, pp. 266–7: Connecticut, U.S.A. Woodhead 1943, pp. 379–80: Michigan, U.S.A. Byers 1944, pp. 173–80: Florida, U.S.A. Fincher 1944, pp. 428, 429: Mississippi, U.S.A. Despax 1945, pp. 157, 158: Toulouse, southern France. Fauré-Fremiet 1945, pp. 121–3: France. Larambergue 1945, pp. 13–18, figs.: Lyon, France. Dobreanu & Serbanesco 1946, pp. 182–5, one fig.: Rumania. Bassindale 1948, pp. 147, 148, Pl. 12: Witcombe Reservoir, England. Käfer 1948, pp. 54–7, figs.: Switzerland. Oestreich 1948, p. 181: Germany. Stefanelli 1948, pp. 41–5, one fig.: as *Craspedacusta*; Torino, Italy. Zavadsky 1948, pp. 921–3, figs.: as *C. marginata* (Modeer); Tashkent, Turkestan. Dexter 1949, pp. 235–41, figs.: Ohio and Pennsylvania, U.S.A. Weill 1949, pp. 349, 350: as *Craspedacusta*; river Dropt, S. France. Berrill 1950, p. 298, fig. 3A–M: development. Kramp 1950, pp. 165–84, text-figs. 1–4, 8, Pl. 1, figs. 1–4, Pl. 2, figs. 4–5; China. Ringuelet 1950, pp. 135–50, Pls. 1–3, fig. 1: Argentine. Schmidt-Ries 1950, pp. 73–6: river Rhine, Germany. Thomas 1950, pp. 312, 313: Adelaide (first record from Australia). Tresselt 1950, p. 478: Virginia, U.S.A. Alt 1951, pp. 19–31, Pls. 1–3: river Main, Germany. Arnold 1951, pp. 81, 82: California, U.S.A. Crowell 1951, p. 309: polyp stage. Miart & Duvigneaud 1951, pp. 48–50: river Meuse, Belgium. Thomas 1951, pp. 59–65: Adelaide, Australia. Uchida 1951*a*, pp. 157–60, figs. 1, 2: *C. sowerbyi* different from *C. iseana*; Japan. Ookawa 1952, p. 1–5: water content. Thompson 1952: Illinois, U.S.A. Chadwick & Houston 1953, pp. 36–7: Tenessee, U.S.A. Hobbs & Page 1953, p. 137: Virginia, U.S.A. Jackson 1953, p. 429: Pennsylvania, U.S.A. Oye & Haeck 1953, pp. 329–30: Ghent, Belgium. Russell 1953, p. 408, Pl. 24, fig. 1, text-figs. 268–73 (medusa) and 274 (polyp): occurrence in Great Britain. Hummelinck 1954, p. 166: as *Maeotias marginata*; no longer occurring in Zuider Zee, Holland. McNeill 1954, pp. 225–7: Sydney, Australia. Moore 1954, pp. 1–4: as *Craspedacusta*: Illinois, U.S.A. Symoens 1954, pp. 38–40: Bruxelles, Belgium. Uchida 1955*b*, pp. 114–17, map: survey of Japanese localities; comparison with *C. iseana*. Kidd 1956, pp. 139–40: Lancashire, England. Pennak 1956, pp. 324–31: Colorado, U.S.A. Robert 1956, p. 49: eastern Canada. Bouillon 1957*b*, pp. 253–500, fig. 114, map: *Craspedacusta* is proposed united with *Limnocnida*. Price 1957, pp. 83–5: Pennsylvania and Maryland, U.S.A. Reisinger 1957, pp. 656–98, figs. 1–25: reproduction. Rice 1957, p. 295: Richmond, Virginia, U.S.A. Tiffon 1957, pp. 550–3: estuary of Gironde, France. Valkanov 1957, p. 17: as *C. ryderi*; Black Sea. Wiggins, Whitfeld & Walden 1957, pp. 1–6: Ontario, U.S.A. Lyttle 1958, pp. 304–8: Indiana, U.S.A. Rice 1958, pp. 525–6: Richmond, Virginia, U.S.A. Southcott 1958, p. 54, fig. 1A: South Australia. Kramp 1959*a*, p. 172: diagnosis. McClary 1959, pp. 158–62: effect of temperature. Shieh & Wang 1959, pp. 201–3, text-fig. 1, Pl. 1: as *C. kuoi* n.sp.; Taiwan.

Genus ***Cubaia*** Mayer 1894

Olindiadidae with four simple radial canals, without centripetal canals; with numerous enclosed statocysts; with two series of tentacles, one series issuing from exumbrella above bell margin and with tentacles provided with an adhesive disk near terminal end and a number of nematocyst rings; the other series of tentacles without adhesive disk but with numerous rings of nematocysts, arising from bell margin.

Type-species: *C. aphrodite* Mayer.

MAYER 1894, p. 237: *Cubaia* n.g.

Cubaia aphrodite Mayer 1894

12 mm wide, slightly flatter than a hemisphere; manubrium flask-shaped; mouth with four simple lips; gonads papilliform on middle region of radial canals; about 20 tentacles issuing from a zone above bell margin, with about eight rings of nematocysts and an adhesive disk; 50–60 tentacles arising from bell margin, with 25–30 rings of nematocysts; about 35 statocysts.

MAYER 1894, p. 237, Pl. 2, figs. 1–3: *Cubaia aphrodite* n.g., n.sp.; Bahamas; p. 238, Pl. 1, figs. 3–6: as *Ireniopsis primordialis* n.sp.; Florida. MAYER 1910, p. 351, Pl. 46, fig. 6, Pl. 47, figs. 1–7: synonyms. KRAMP 1959*a*, pp. 174, 231, fig. 248: diagnosis; distribution.

Genus ***Eperetmus*** Bigelow 1915

Olindiadidae with four radial canals and several centripetal, blind canals; oral lips with nematocyst knobs; with numerous tentacles of one kind, not in groups, situated on exumbrella at different heights above bell margin, with rings of nematocysts, without adhesive pads; with numerous statocysts.

Type-species: *E. typus* Bigelow.

BIGELOW 1915*a*, p. 399: *Eperetmus* n.g.

Eperetmus typus Bigelow 1915

23 mm wide, 15 mm high; four well developed, crenulated lips with one row of nematocyst knobs; centripetal canals up to about 16 in each quadrant, tapering upwards; tentacles more numerous than centripetal canals, of different sizes; statocysts nearly alternating with tentacles.

BIGELOW 1915*a*, p. 401, Pl. 59, figs. 1–8: *Eperetmus typus* n.g., n.sp.; southern Alaska. ?BIGELOW 1920, p. 9: ?*E. typus*; Port Clarence, Alaska. FOERSTER 1923, p. 263: Vancouver, Pacific coast of Canada; report of Bigelow. UCHIDA 1929*a*, p. 364, Pl. 1, fig. 5, text-fig. 8: Japan. THIEL 1932*a*, p. 150. THIEL 1932*b*, pp. 444 ff.: distribution in Arctic. UCHIDA 1940*a*, p. 291, fig. 7: as *E. typicus*; Hokkaido, Japan.

Genus ***Gonionemus*** A. Agassiz 1862

Olindiadidae with four radial canals; without centripetal canals; with numerous uniform tentacles, all with an abaxial adhesive pad near the outer end, and with rings of nematocysts; with a large and indefinite number of statocysts.

Type-species: *G. vertens* A. Agassiz.

A. Agassiz 1862, p. 530: *Gonionemus* n.g. Haeckel 1879, p. 146: as *Gonynema.* Mayer 1910, p. 341: *Gonionemus.* Naumov 1955*b*, pp. 102–9: survey of species of *Gonionemus*; three species are retained: *G. gemmifera, suvaensis* and *vertens.*

Gonionemus vertens A. Agassiz 1862 *

15–20 mm wide, hemispherical or somewhat flatter; stomach somewhat shorter than bell cavity, mouth with four short, crenulated lips; gonads along greater portion of radial canals, folded; 60–80 long, rather stiff tentacles, each with an adhesive pad near distal end which is sharply bent; statocysts about as numerous as tentacles.

A. Agassiz 1862, p. 350: *Gonionemus vertens* n.g., n.sp.; Puget Sound, Pacific coast of N. America. Haeckel 1879, p. 147: as *Gonynema vertens.* Mayer 1901, p. 5: as *G. murbachi* n.sp.; New England, U.S.A. Goto 1903, p. 12, Pl. 2, figs. 10–13, Pl. 3, figs. 21, 22: as *Gonionema depressum* n.sp.; Japan. Murbach & Shearer 1903, p. 185, Pl. 21, figs. 1–3, Pl. 22, fig. 3: as *G. agassizi* n.sp.; Unalaska, Aleutian Islands. Mayer 1910, p. 343: as *G. vertens*; (Pacific coast of North America; Gulf of Georgia, west coast of U.S.A.); p. 343, Pl. 45, figs. 1–4, Pl. 46, figs. 1–3, text-fig. 197: as *G. murbachi*; New England, U.S.A.; p. 348: as *G. agassizi*; p. 348: as *G. depressus.* Robson 1913*a*, pp. 27, 28, Pl. 2: as *Cladonema* sp.; Cullercoats, England Bigelow 1914*b*, p. 20: as *G. murbachi*; New England, U.S.A. Gordon 1915, p. 26: as *G. murbachi*; Connecticut, U.S.A. Kinoshita 1916, pp. 425–51: *Gonionemus.* Hartlaub 1917, p. 402: doubtful that Robson's specimen belongs to *Cladonema.* Joseph 1918*a*, p. 2: comparison with *G. vindobonensis* n.sp. Joseph 1918*b*, pp. 95–158: comparison with *G. vindobonensis.* Neppi 1918*a*, pp. 3, 4: regeneration. Broch 1919, p. 485, text-figs. 1–4: as *G. vertens, murbachi* and *agassizi*; distribution. Thomas 1921, pp. 287–98, Pl. 1, three figs.: as *G. murbachi*; otocysts. Kramp 1922, p. xi: as *G. murbachi*; Kristianiafjord, Norway. Lengerich 1922*b*, pp. 34–6: as *Eleutheria robsonia* n.sp. Foerster 1923, p. 264: as *G. vertens* and *agassizi*; Vancouver, Pacific coast of Canada. Lengerich 1923*b*, p. 335: as *E. robsonia.* Joseph 1924, pp. 129–33: as *G. murbachi.* Joseph 1925, pp. 374–434, one Pl.: *Gonionemus* belongs to Trachymedusae. Uchida 1925*b*, p. 94, figs. 18, 19: as *Gonionemus murbachi* var. *oshoro* nov. var.; Japan. Perkins 1926, p. 93: as *G. murbachi*; Woods Hole, U.S.A. Uchida 1927*b*, p. 224: as *Gonionema murbachi* var. *oshoro*; Japan. Wolff 1928, p. 547, text-figs. 1–8: as *Gonionemus*; Woods Hole, U.S.A. Broch 1929, p. 485, fig. 1: *G. vertens*; p. 486, fig. 2: as *G. murbachi*; p. 488, fig. 3: as *G. murbachi* var. *oshoro*; Japan; p. 489, fig. 4: as *G. agassizi.* Rugh 1929, pp. 261–6: as *G. murbachi*; egg-laying habits. Uchida 1929*a*, p. 358: as *G. depressum, =agassizi* Kirkpatrik 1903, non *=agassizi* Murbach & Shearer 1902; Japan; p. 359; Pl. 1, fig. 1: as *G. oshoro*; Japan. Lönnberg 1930, p. 173, fig. 2: as *G. murbachi*; Gullmarfjord, Sweden. Rugh 1930, pp. 93–5, one fig.: as *G. murbachi*; variation. Teissier 1930, p. 185: as *G. murbachi*; Roscoff, France. Uchida 1930, p. 335: as *G. depressum*; Sagami Bay, Japan. Okada 1932, pp. 205–12, figs. 1–7: as *G. depressus*; regeneration. Teissier 1932*b*, pp. 115, 116: as *G. murbachi*; Brittany, France. Thiel 1932*a*, p. 151: as *G. agassizi*, incl. *depressus* and as *G. vertens*. Thiel 1932*b*, pp. 444 ff.: as *G. agassizi*; distribution in Arctic. Kramp 1937*b*, p. 127, fig. 58*a*: as *G. murbachi*. Ling 1937, p. 358, figs. 11–14: as *G. murbachi* var. *chekiangensis* nov. var.; Chekiang coast, China. Uchida 1938*a*, p. 146: as *G. depressum*; Japan. Uchida 1938*b*, p. 42: as *G. oshoro*; discussion of species; Japan. ?Uchida 1938*c*, p. 54: as *Gonionemus* sp. (? = *G. depressum*); Onagawa, Japan. Weill 1938, p. 33: *G. murbachi, depressus, oshoro, agassizi, vertens* and *vindobonensis* belong to the genus *Gonionemus* sensu strictu. Hyman 1940, pp. 282–95: physiology. Uchida 1940*a*, p. 291: '*G. agassizi*' probably large specimens of *G. oshoro*; Akkeshi Bay, Japan. Komai & Yamazi 1945, p. 1, fig. 1: as *G. depressum*; Japan. Fraser 1946, pp. 119–22: *G. murbachi* = *vertens*; northern Pacific. Kramp 1947, p. 56: as *G. murbachi*. Leloup 1948, pp. 1–4, fig.: as *G. murbachi*; Belgium. Berrill 1950, p. 296, fig. 2a–l: as *G. murbachi*, referred to Trachymedusae. Teissier 1950*a*, p. 6: as *G. murbachi*; Roscoff, France. Werner 1950*a*, pp. 138–51, figs. 1–9: as *G. murbachi*; Sylt, S.E. North Sea. Werner 1950*b*, pp. 471–505, figs. 2–8: as *G. murbachi*; Sylt. Komai 1951, p. 75: as *G. depressum*. Picard 1951*c*, pp. 40 ff.: *G. vertens* = *G. murbachi, agassizi* and probably = *depressum*; young specimens of *G. vertens* are very like *G. vindobonensis*; Villefranche, Mediterranean coast of France. Picard 1952*c*, p. 230: French Mediterranean coast. Brian & Pérès 1953, p. 149: Golfe de Lion, Mediterranean. Russell 1953, p. 398, Pl. 23, fig. 2, text-fig. 263, Pl. 35: Port Erin; Cullercoats. Chiu 1954*b*, pp. 49, 52, 55: as *G. murbachi* var. *chengshanensis*; China; p. 56: as *G. agassizii*. Naumov 1955*b*, pp. 102–9, figs. 1–3. Picard 1955*a*, pp. 60, 68: description of cnidomes; Mediterranean. Naumov 1956*b*, pp. 38, 40. Carthy 1958, pp. 36, 197, 243: as *G. murbachi*; responses to stimuli. Chow & Huang 1958, pp. 186, 189, Pl. 5, fig. 41: as *G. murbachii* var. *oshoro* and var. *chekiangensis*; Chefoo, China. Yamazi 1958, p. 137: as *G. depressus*; Tanabe Bay, Japan. Howe 1959, p. 1963: Aberdour, Fife, Scotland, in aquarium. Kramp 1959*a*, pp. 174, 211, 213, 214, 215, 218, 219, 224, 265, 271, fig. 246: diagnosis: distribution.

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* See Addenda, p. 445.

Gonionemus vindobonensis Joseph 1918

1·6 mm wide, height 3/4 of diameter; manubrium short; gonads not developed: 12–17 tentacles, sharply bent; adhesive pad at some distance from tip; 4–9 statocysts.

Joseph 1918*a*, p. 2: provisional account. Joseph 1918*b*, pp. 95–158, one tab., figs.: *Gonionemus vindobonensis* n.sp.; Trieste, Adriatic Sea, in aquarium. Joseph 1918*c*, p. 251: provisional statement. Joseph 1924, pp. 129–33: provisional statement on *Haleremita* and *Gonionemus; Eleutheria robsoni* = *G. vindobonensis*. Joseph 1925, pp. 374–434, tab. VIII, figs.: *Gonionemus* belongs to Trachymedusae. Picard 1951*c*, p. 41: young specimens of *G. vertens* are very like *G. vindobonensis*; Villefranche, Mediterranean coast of France. Kramp 1959*a*, pp. 174, 215, 217, 223: distribution: probably = *G. vertens*.

Genus ***Gossea*** L. Agassiz 1862

Olindiadidae with four radial canals; without centripetal canals; with one kind of tentacles arranged in groups, without adhesive pads.

Type-species: *G. corynetes* (Gosse).

Gosse 1853, p. 407, Pl. 21: as *Thaumantias*. L. Agassiz 1862, p. 366: *Gossea* n.g.

Gossea brachymera Bigelow 1909

Up to 20 mm wide, dome-shaped, jelly thick and rigid; stomach small, on a short, broad peduncle; four short lips with nematocysts; gonads extending from base of peduncle almost to ring canal, wavy, distal ends sac-like, pendent; four perradial and four interradial marginal nematocyst pads, each with one large and one minute tentacle; in addition several isolated tentacles in very different stages of development, without adjacent dwarf-tentacle; eight statocysts enclosed in the perradial and interradial nematocyst pads.

Bigelow 1909*a*, p. 103, Pl. 30, figs. 1–10: *Gossea brachymera* n.sp.; Acapulco, Mexico Pacific coast. Mayer 1910, p. 368. Foerster 1923, p. 264. Russell 1938*a*, pp. 707–10, Pl. 1, figs. 1–3: new description; Louisiana, U.S.A. (brackish water). Kramp 1957*a*, pp. 42, 124, Pl. 5, figs. 2, 3, text-fig. 8, map: Straits of Magellan, South America. Kramp 1959*a*, pp. 177, 230, 231, 233, 235, 237, 270, fig. 254: diagnosis; distribution.

Gossea corynetes (Gosse 1853)

12 mm wide, 10 mm high, jelly fairly thick and rigid; stomach short, mouth with four crenulated lips; gonads wavy, extending along greater part of radial canals; 24 tentacles in eight groups, all of about equal size, and 8–16 isolated tentacles; all tentacles with rings of nematocysts; endodermal core of tentacles extending into marginal jelly; 24 statocysts, three between adjacent groups of tentacles.

Gosse 1853, p. 407, Pl. 21: as *Thaumantias corynetes* n.sp.; Devonshire, England. L. Agassiz 1862, p. 366: *Gossea corynetes* n.g. Haeckel 1879, p. 252, Pl. 18, fig. 4: as *G. circinata* n.sp.; Atlantic coast of France. Mayer 1910, p. 367, fig. 210: (Ireland). Int. Plankt. Catal. III 1916, p. 44: English Channel. Kramp 1924, p. 21: English Channel. Ranson 1926, p. 298, figs. 1, 2: English Channel. Broch 1929, p. 490, text-fig. 5. Kramp 1930, p. 32: S.W. North Sea; Strait of Dover; Newhaven, England. Kramp 1937*b*, p. 128, fig. 58*b*. Künne 1937*a*, pp. 142, 147, 156, 160, 162: North Sea. Kramp 1938*a*, p. 107: belongs to Limnomedusae, new suborder. Kramp 1938*b*, pp. 52, 53, 55, 58: belongs to Limnomedusae. Russell 1938*a*, p. 709: comparison with *G. brachymera*. Russell 1938*b*, pp. 412, 413, 416, 419, 437: Plymouth. Leloup 1947, p. 42: Belgium. Russell 1953, p. 403, Pl. 23, fig. 1, text-figs. 264–7: southern coasts of Britain. Lubet 1954, p 213: Arcachon, Atlantic coast of France. Southward 1954, p. 19: Irish Sea. Kramp 1959*a*, pp. 176, 215, 217, 218, 222, 223, fig. 253: diagnosis; distribution.

Gossea faureae Picard 1952

Similar to *G. corynetes*; the gonads leave the proximal 1/3 of the radial canals free; each perradial and interradial group of three tentacles consists of one median, strong, between one of medium size and one faintly developed; statocysts in same number as in *C. corynetes*, but in slightly different arrangement.

Picard 1952*b*, p. 67: *G. faureae* n.sp.; Atlantic coast of Morocco. Kramp 1959*a*, pp. 176, 224: diagnosis; distribution.

Genus **Maeotias** Ostroumoff 1896

Olindiadidae with four radial canals and with centripetal canals; with numerous tentacles all of same kind on bell margin, not in groups, without adhesive organs, and with small secondary marginal clubs; with numerous statocysts.

Type-species: *M. inexpectata* Ostroumoff.

Ostroumoff 1896, p. 402: *Maeotias* n.g.

Maeotias inexpectata Ostroumoff 1896

Up to 39 mm wide and 24 mm high; stomach prismatic, mouth with four very long, crenulated lips with clusters of nematocysts; gonads folded, extending along more than half the length of the radial canals; many centripetal canals of different lengths; up to 360 very long tentacles with rings of nematocysts, and numerous short, club-shaped marginal appendages; statocysts of about same number as clubs.

Ostroumoff 1896, p. 402, Pl. 1, figs. 1, 3: *Maeotias inexpectata* n.g., n.sp.; estuaries of Don and Kuban rivers, Sea of Azov. Mayer 1910, p. 369. Borcea 1928, pp. 643–55, figs. 1–8: Black Sea. Kramp 1959*a*, p. 173, fig. 245: diagnosis.

Genus **Nuarchus** Bigelow 1912

Olindiadidae with six radial canals, without centripetal canals; tentacles of one kind, without adhesive pads, not in groups; mouth simple, circular; gonads leaf-like; statocysts at base of tentacles.

Type-species: *N. halius* Bigelow.

Bigelow 1912, p. 258: *Nuarchus* n.g.

Nuarchus halius Bigelow 1912

12 mm wide, thick centrally, thinner near margin; stomach hexagonal, flat, mouth with simple, circular, thickened margin; gonads flat and leaf-like, on greater portion of the six radial canals; 12 equidistant tentacles with rings of nematocysts distally, issuing from above margin; a statocyst close beside each tentacle.

Bigelow 1912, p. 258: *Nuarchus halius* n.g., n.sp.; provisional description; Philippines. Bigelow 1919, p. 320, Pl. 43, figs. 1–5: discussion of the genus; Philippines.

Genus **Olindias** F. Müller 1861

Olindiadidae with four radial canals and with numerous centripetal canals; gonads with papilliform processes; numerous tentacles of two kinds: primary tentacles issuing above bell margin, with distal adhesive pads and with nematocysts in transverse clasps; secondary tentacles on bell margin, without adhesive pads and with nematocysts in rings; also numerous marginal clubs which may develop into tentacles. Statocysts usually in pairs at base of primary tentacles.

Type-species: *O. phosphorica* (Delle Chiaje).

MÜLLER 1861, p. 312: *Olindias* n.g. HAECKEL 1879, p. 352. BIGELOW 1919, p. 317. UCHIDA 1929*a*, p. 366: *Olindioides* Goto = *Olindias*.

Olindias malayensis Maas 1905

25–35 mm wide, height greater than half diameter; jelly thick; 7–9 centripetal canals in each quadrant; gonads along nearly whole length of radial canals, gonadial papillae thickly crowded, very elongated, club-shaped; 20–30 primary tentacles, thick; 30–40 secondary tentacles, thin: 120 clubs. Probably a variety of *O. phosphorica*.

MAAS 1905, p. 47, Pl. 9, figs. 60, 61: as *Olindias phosphorica* nov. var. *malayensis*; Malay Archipelago. MAYER 1910, p. 356, figs. 201, 202: *O. malayensis*.

Olindias phosphorica (Delle Chiaje 1841)

40–60 mm wide; umbrella almost hemispherical, jelly fairly thick; 11–19 centripetal canals in each quadrant; 50–60 primary tentacles; usually two statocysts at base of each primary tentacle; 100–120 secondary tentacles; 100–170 marginal clubs.

DELLE CHIAJE 1841, p. 131, Pl. 147, figs. 1–3: as *Oceania phosphorica* n.sp.; Mediterranean. HAECKEL 1880, p. 654: *Olindias phosphorica*. GRAEFFE 1884, p. 359: as *O. mülleri* n.sp. BIGELOW 1909*a*, p. 109: as *O. mülleri*. MAYER 1910, p. 355: *O. phosphorica*, = *O. mülleri* Haeckel 1879. NEPPI & STIASNY 1913*b*, p. 78: Trieste, Adriatic Sea. NEPPI 1919, p. 124: abnormal specimen; Naples, Italy. CAZIOT 1921, p. 114: Villefranche-sur-Mer, France. ALVARADO 1923*a*, pp. 167–73: as *O. mülleri*; histology. ALVARADO 1923*b*, pp. 15 ff, Pls. 1-6, 12: as *O. mülleri*; histology. ALVARADO 1931*a*, pp. 71–80, figs. 1–7: as *O. mülleri*; morphology. ALVARADO 1931*b*, pp. 89–93, figs. 1, 2: as *O. mülleri*; morphology. ALVARADO 1932, pp. 11–18, figs. 1–4: as *O. mülleri*; morphology. ZIRPOLO 1932, pp. 367–75, five figs.: as *O. mülleri*; abnormal specimens; Naples, Italy. WEILL 1936*b*, p. 1018, fig.: polyp-larva; Bermudas. PICARD 1951*c*, p. 40: Villefranche and Bay of Marseille, France. PICARD 1952*c*, pp. 230–1: French Mediterranean coast. CHIU 1954*b*, p. 55. KRAMP 1955*a*, p. 267: off mouth of Niger and Congo, W. Africa. PICARD 1955*a*, p. 66: description of young stage, Marseille. BREDER 1956, pp. 13–15, Pls. 1, 2, five figs.: as *O. phosphorica tenuis*; behaviour; Bahamas. HARTMAN & EMERY 1956, p. 307. BOUILLON & VANDERMEERSSCHE 1957, pp. 9–25: histology of mesogloea. KRAMP 1959*a*, pp. 173, 223, 227, 232, 234, 265, fig. 244: diagnosis; distribution. KRAMP 1959*b*, p. 10: West Africa.

Olindias sambaquiensis F. Müller 1861

50–100 mm wide; 21–27 centripetal canals in each quadrant; 80–100 primary tentacles, 200–300 secondary tentacles; 100–200 clubs. Probably a variety of *O. phosphorica*.

Müller 1861, p. 312, Pl. 9: *Olindias sambaquiensis* n.sp.; coast of Brazil. Mayer 1910, p. 354. Vannucci 1951*a*, p. 72, Pl. 1, fig. 1, Pl. 2, fig. 4: discussion of species of *Olindias; O. sambaquiensis* different from *O. tenuis*. Vannucci 1951*b*, pp. 111, 115, 116: Brazil. Vannucci 1957*d*, p. 102. Kramp 1959*a*, p. 173: var. of *O. phosphorica*.

Olindias singularis Browne 1905

13–36 mm wide, height half of diameter; 4–12 centripetal canals in each quadrant; gonads along distal half of radial canals or slightly longer; 28–86 primary tentacles, adhesive pads rudimentary; 16–50 secondary tentacles; 32 to more than 100 clubs. Usually only one statocyst at base of each primary tentacle.

Browne 1905*a*, p. 737, Pl. 56, fig. 2, Pl. 57, fig. 1: *Olindias singularis* n.sp.; Maldive Islands, Indian Ocean. Bigelow 1909*a*, p. 109, Pl. 4, fig. 1, Pl. 31, figs. 1–10, Pl. 32, fig. 8: Low Archipelago, tropical Pacific. Mayer 1910, p. 357. Browne 1916*a*, p. 192: Chagos Archipelago, Indian Ocean. Bigelow 1919, p. 318: Philippines. Menon 1931, p. 503: Madras, India. Stiasny 1931*b*, p. 27: North Queensland, Australia. Menon 1932, p. 27: Madras, India. Menon 1945, p. 41: Trivandrum coast, India. Nair 1951, p. 69: Trivandrum coast, India. Kramp 1953, p. 298: variation; N.E. Australia. Chiu 1954*b*, p. 55. Kramp 1956*b*, p. 237: Iranian Gulf. Vannucci 1957*d*, p. 102. Kramp 1958*b*, p. 366: Karachi, Pakistan; Nicobars, Indian Ocean.

Olindias tenuis (Fewkes 1882)

35 mm wide; 7–10 centripetal canals in each quadrant; 32–54 primary tentacles; 38–70 secondary tentacles; 64–69 clubs. Probably a variety of *O. phosphorica*.

Fewkes 1882*a*, p. 277, Pl. 7, fig. 15: as *Halicalyx tenuis* n.g., n.sp.; Tortugas, Florida. Browne 1905*a*, p. 737: *Olindias tenuis*. Bigelow 1909*a*, p. 109. Mayer 1910, p. 354, Pl. 47, figs. 8–10, Pl. 48, figs. 1–7: (Bahamas; Bermudas); Florida. Weill 1936*b*, p. 1018, fig. (polyp-larva): as *O. phosphorica*; Bermudas. Bigelow 1938, p. 113: as *O. phosphorica tenuis*; Bermudas. Breder 1956, pp. 13–15, Pl. 1, 2: *O. phosphorica tenuis*; Bahamas. Kramp 1959*a*, p. 173: var. of *O. phosphorica*. Suarez-Caabro 1959, p. 27: *O. phosphorea tenuis*; Cuba, Caribbean Sea.

Olindias sp. Uchida 1947

Uchida 1947*a*, p. 309, fig. 9: *Olindias* sp.; Sunda Strait.

Genus ***Olindioides*** Goto 1903

Similar to *Olindias*, but with six radial canals; with some of the primary tentacles very high up on exumbrella.

Type-species: *O. formosa* Goto.

Goto 1903, pp. 3, 19: *Olindioides* n.g.

Olindioides formosa Goto 1903

75 mm wide, height about half of diameter; gonads along nearly whole length of radial canals; 264 primary tentacles; 18–23 centripetal canals in each quadrant; 10–15 long secondary tentacles; about 300 clubs. Statocysts twice as many as primary tentacles.

GOTO 1903, p. 3, Pl. 1, figs. 1–9, Pl. 2, figs. 14–16, Pl. 3 figs. 17–20: *Olindioides formosa* n.g., n.sp.; Japan. MAYER 1910, p. 358, fig. 203. BIGELOW 1913, p. 41: Japan. UCHIDA 1929*a*, p. 368, Pl. 1, figs. 6–10, text-figs. 9, 10: as *Olindias formosa*; Japan. UCHIDA 1938*a*, p. 147: as *Olindias formosa*; Amakusa, Japan. KOMAI & YAMAZI 1945, p. 2, figs. 2–5: as *Olindias formosa*; Japan. KOMAI 1951, p. 75: as *Olindias formosa*. UCHIDA 1958, p. 164: as *Olindias formosa*: Sado, Japan. YAMAZI 1958, p. 137: as *Olindias formosus*; Tanabe Bay, Japan.

Genus ***Scolionema*** Kishinouye 1910

Similar to *Gonionemus*, but with number of statocysts not exceeding 16. Type-species: *S. suvaense* (Agassiz & Mayer 1899).

KISHINOUYE 1910, p. 31: *Scolionema* n.g.

Scolionema suvaense (Agassiz & Mayer 1899)

9 mm wide, about 6 mm high, jelly thick; gastric peduncle indicated; stomach cruciform, about half as long as bell cavity, mouth with four small lips; gonads extending along distal 1/3 – 1/2 of radial canals, ribbon-shaped, much folded; 40–70 tentacles of different lengths, globular bulbs with brownish pigment spots; nematocyst rings throughout whole length of tentacles; distal end sharply bent, but adhesive pads rudimentary; 16 statocysts.

AGASSIZ & MAYER 1899, p. 164, Pl. 5, figs. 14–16: as *Gonionemus suvaensis* n.sp.; Fiji Islands, Pacific. BROWNE 1905*b*, p. 149, Pl. 1, fig. 6, Pl. 2, fig. 4: as *G. hornelli* n.sp.; Gulf of Manaar, India. BIGELOW 1909*a*, p. 106: as *G. hornelli*; p. 107, Pl. 3, figs. 4, 5, Pl. 32, figs. 1–7: as *G. suvaensis*; Low Archipelago, Pacific. KISHINOUYE 1910, p. 31, Pl. 5, figs. 32, 33: as *Scolionema* n.g. *gemmifera* n.sp.; Japan. MAYER 1910, p. 349, figs. 199, 200: as *G. suvaensis*, =*G. pelagicus* Bigelow 1904; (Paumotos Islands and Fiji Islands, tropical Pacific; Maldive Islands, Indian Ocean); p. 350: *G. hornelli* – *G. suvaensis*; p. 725: as *Cubaia gemmifera*. KINOSHITA 1916, pp. 425–51: *Scolionema*. UCHIDA 1925*b*, p. 96: as *G. gemmifera*, =*S. gemmifera* Kishinouye 1910, *G. vertens* var. *depressum* Maas 1909 and *Cubaia gemmifera* Mayer 1910; Japan. UCHIDA 1929*a*, p. 360, Pl. 1, figs. 2–4, text-figs. 5–7: as *S. gemmifera*; Japan. UCHIDA 1930, p. 335: demonstrates that Maas's specimens of *G. vertens* var. *depressum* = *S. gemmifera*. MENON 1932, p. 26, Pl. 2, figs. 20, 21: as *G. suvaensis*; Madras, India. OKADA 1932, p. 209, fig. 4: as *S. gemmifera*; regeneration. UCHIDA 1938*a*, p. 146: as *S. gemmifera*; discussion; Japan. WEILL 1938, pp. 33–41, figs. 1–3: as *G. suvaensis* and *hornelli*; belong to the subgenus *Miocystidium* Joseph 1918. NAIR 1951, p. 68: *G. hornelli* and *pelagicus* synonyms of *G. suvaensis*; Trivandrum coast, India. PICARD 1951*c*, p. 44: *S. suvaensis*, incl. *S. gemmifera* and *hornelli*; discussion; Villefranche-sur-Mer, Mediterranean. PICARD 1952*c*, pp. 230–1: French Mediterranean coast. BRIAN & PÉRÈS 1953, p. 149: Gulf of Lion, Marseilles. PICARD 1955*a*, pp. 61, 68: ? = *Cubaia aphrodite* MAYER 1904; French Mediterranean coast. NAUMOV 1955*b*, pp. 102–9, fig. 2: as *G. suvaensis* and *gemmifera*. GANAPATI & NAGABHUSHANAM 1958, p. 93, 94: Vizagapatam coast, India; as *G. suvaensis*. KRAMP 1958*b*, p. 365: The Nicobars, Indian Ocean. YAMAZI 1958, p. 137: as *S. gemmifera*; Tanabe Bay, Japan. KRAMP 1959*a*, pp. 174, 224, 231, 232, 270, fig. 247: diagnosis; distribution.

Genus ***Vallentinia*** Browne 1902

Olindiadidae with four radial canals; without centripetal canals; with 4–8 large, hollow tentacles with a terminal adhesive pad, and numerous tentacles without adhesive pad but with numerous rings of nematocysts; with 16 or more statocysts.

Type-species: *V. falklandica* Browne.

BROWNE 1902, p. 283: *Vallentina* n.g., to Petasidae.

Vallentinia adherens Hyman 1947

Size? Bowl-shaped; stomach short, quadrangular; gonads extending as a ruffled fold under the radial canals; four long tentacles with terminal adhesive disks, not perradially placed; 40 or more tentacles with rings of nematocysts; small cirrus-like tentacles with rings of nematocysts, approximately alternating with the other tentacles; statocysts one or two between successive tentacles.

HYMAN 1947, p. 264, figs. 6, 7: *Vallentinia adherens* n.sp.; California. HARTMAN & EMERY 1956, p. 307. KRAMP 1959*a*, p. 175.

Vallentinia falklandica Browne 1902

2 mm wide, 3 mm high; stomach short, mouth with four short, simple lips with nematocysts; gonads oval, sac-like, on upper part of radial canals; four large perradial tentacles with scattered nematocysts and a terminal adhesive pad; 24 tentacles with numerous rings of nematocysts; 16 statocysts.

BROWNE 1902, p. 283, 284: *Vallentinia falklandica* n.g., n.sp.; Falkland Islands, southern Atlantic. MAYER 1910, p. 352: probably a young *Olindias*. BROWNE & KRAMP 1939, p. 317, Pl. 18, figs. 17–19, Pl. 19, figs. 6, 7: Falkland Islands. KRAMP 1959*a*, pp. 175, 235, fig. 249: diagnosis; distribution.

Vallentinia gabriellae Mendes 1948

Up to 6 mm wide, about 2/3 as high as wide; jelly fairly thin; stomach hemispherical, mouth-tube fairly long and thin; four simple lips with nematocysts; gonads sac-like, folded, on proximal portions of radial canals; four or eight large tentacles with scattered nematocysts and with a terminal adhesive disk, arising from the exumbrella above the bell margin and situated at some distance from the radial canals; occasionally also four similar interradial tentacles; 64 or more (up to 75) tentacles arising from the bell margin, with numerous rings of nematocysts, the oldest of them sometimes with a small adhesive disk externally near terminal end apex; no small cirrus-like tentacles; one or two statocysts between successive tentacles.

Mendes 1948, pp. 73 ff., Pls. 1, 2: *Vallentinia gabriellae* n.sp.; Santos Bay, Brazil. Vannucci 1951*b*, pp. 111, 116: Brazil. Kramp 1959*a*, pp. 175, 232, 234, fig. 250: diagnosis; distribution.

Family *LIMNOCNIDIDAE*

Limnomedusae with a simple circular stomach; with simple radial canals; with gonads on stomach wall only; with enclosed marginal vesicles.

Genus ***Limnocnida*** Günther 1893

Limnocnididae with a marginal, folded band of nematocysts; with numerous marginal tentacles and statocysts; the proximal portion of the tentacles is adherent for some distance to the exumbrella.

Type-species: *L. tanganyicae* Günther.

Günther 1893, p. 269: *Limnocnida* n.g.

Limnocnida indica Annandale 1912

15 mm wide, almost three times as wide as high; with four radial canals; with two distinct series of marginal tentacles; up to 64 long primary tentacles, tapering in thickness from base outwards, and five times as many small secondary tentacles of almost equal width throughout; two statocysts between successive primary tentacles.

Annandale 1911, p. 144: as *Limnocnida tanganyicae*; Koyna and Yennah rivers, India. Alcock 1911, p. 214: as *L. tanganyicae*; Chota Nagpore, India. Annandale 1912, pp. 253–6: *Limnocnida indica* n.sp.; W. Ghats, India. Gravely & Agharkar 1912, pp. 399–403: India. Agharkar 1913, pp. 247–9. Annandale 1918, p. 110: Yennah river, India. Hora 1926, p. 449. Rao 1931*b*, p. 97, one text-fig.: resting stage; India. Rao 1932, pp. 210–217. Darling 1935, p. 151: Travancore, India. Ramakrishna, Bhimochar & Subramaniam 1950, pp. 318–19: S.W. India. Jones 1952, pp. 799–801: river Sahyadris, India. Krishnamurthy 1952, pp. 955–6: Krishnarajasagar, India. Kramp 1954, p. 212: *L. indica* a distinct species.

Limnocnida tanganyicae Günther 1893

Up to 25 mm wide, disk-shaped; with usually four, but sometimes 5–7 radial canals; with 300–400 tentacles of different sizes, irregularly distributed;

with a large and variable number of statocysts, irregularly distributed; medusae may be produced by budding on the stomach wall.

Böhm 1883, p. 197: as *Tanganjicae* n.g.; Lake Tanganyika, Africa. Günther 1893, p. 269, Pls. 13, 14, eight text-figs.: *Limnocnida tanganjicae* n.g., n.sp. Mayer 1910, p. 370, text-fig. 211: (Tanganyika, Lake Nyanza and river Niger, all localities in Africa). Boulenger 1911*a*, pp. 83–106, Pl. 1: anatomy and bud-formation. Boulenger 1912*b*, pp. 427–38, Pl. 1: as *L. rhodesiae* n.sp.; Rhodesia, South Africa. Arnold 1913, p. 111: Norquane river, South Africa. Arnold & Boulenger 1915, pp. 71–6, Pl. 1: as *L. rhodesiae*; Limpopo river, South Africa. Cunnington 1920, p. 585: *Limnocnida.* Schouteden 1924, p. 48: Congo. Fantham & Porter 1933, pp. 353–4: as *L. rhodesiae*; distribution. Jordaan 1934, pp. 185–8, one fig.: as *L. cymodoce* n.sp.; Johannesburg, Union of South Africa. Jordaan 1935, pp. 493–4: as *L. cymodoce*; Chobe river, South Africa. Schouteden 1935, pp. 67, 68. Edney 1939, pp. 1–11, text-figs.: as *L. rhodesiae*; physiology. Schouteden 1939, pp. 114–17: Ruanda, Congo. Dartevelle 1949, p. 7: Leopoldville, Congo. Berrill 1950, p. 297, one fig.: development. Daget 1950, p. 132, text-figs.: Niger river, W. Africa. Leloup 1951, p. 27, one fig.: *L. tanganyicae*; p. 40: as *L. rhodesiae*; p. 41: as *L. cymodoce* and *indica.* Bouillon 1954, p. 1112: polyp stage of *Limnocnida.* Kramp 1954, pp. 207–13, four figs.: variation; systematic position; Congo. Bouillon 1956, pp. 1152–80, figs. 1–9: budding. Beadle & Thomas 1957, p. 110: life-cycle; fertile medusae, larvae and hydroids; Lake Victoria, Africa. Bouillon 1957*a*, pp. 388–95, Pl. 1, 2: description of *L. congoensis* n.sp., Pl. 1, fig. 3, Pl. 2; Stanley Pool, Congo; p. 394: comparison with *L. tanganyicae* (Pl. 1, fig. 1), *L. victoriae* (=*rhodesiae* and *cymodoce*, Pl. 1, fig. 2), and *L. indica.* Bouillon 1957*b*, pp. 253–500, figs. 1–23, 25–114: description of the polyp; it is proposed to unite *Limnocnida* and *Craspedacusta*; p. 465: comparison between the Olindiidae and the other hydromedusae. Bouillon, Castiaux & Vandermeerssche 1957, pp. 529–44, figs. 1–18: *L. tanganyicae*; histological structure; Tanganyika. Bouillon & Vandermeerssche 1957, pp. 9–25, figs. 1, 3–5, 8–11: histology of mesogloea. Bouillon 1958, pp. 5–8: *L. congoensis*, compared with other species. Bouillon, Castiaux & Vandermeerssche 1958*a*, pp. 34–5, figs. 1–5: *L. tanganyicae*; histology. Bouillon, Castiaux & Vandermeerssche 1958*b*, p. 62, figs. 1, 2, 4, 5: *L. tanganyicae*, histology. Bouillon, Castiaux & Vandermeerssche 1958*c*, pp. 81–7, figs. 1–5: musculature.

Family *PROBOSCIDACTYLIDAE*

Limnomedusae without marginal vesicles; stomach with 4–6 or more radial lobes extending along the proximal portions of the radial canals; gonads surrounding stomach and extending on to basal lobes, rarely interradial on stomach wall alone; radial canals generally branched; tentacle bulbs without ocelli. Polyps, where known, *Lar*-like.

Genus ***Pochella*** Hartlaub 1917

Proboscidactylidae without exumbrellar nematocyst clusters; with four radial canals usually unbranched; with gonads on interradial walls of stomach.

Type-species: *P. polynema* Hartlaub.

HARTLAUB 1917, p. 414: *Pochella* n.g.

Pochella oligonema Kramp 1955

2 mm high and wide, dome-shaped, jelly thick; stomach pyramidal, on a very broad peduncle; mouth with four short simple lips; gonads cushion-like, completely covering the four interradial sides of the stomach; radial canals simple; four perradial tentacles.

KRAMP 1955*a*, p. 270, Pl. 2, fig. 2, text-fig. 7: *Pochella oligonema* n.sp.; Gulf of Guinea, W. Africa. KRAMP 1959*a*, pp. 179, 227, fig. 259: diagnosis; distribution.

Pochella polynema Hartlaub 1917

2–3 mm wide, bell-shaped or hemispherical, jelly fairly thick; stomach large, about 2/3 as long as bell cavity; slightly wavy lips; radial canals often with exceedingly fine branches; gonads cushion-like; 30–40 or more tentacles.

HARTLAUB 1917, p. 414, figs. 344–6: *Pochella polynema* n.g., n.sp.; systematic position doubtful; North Sea. FOERSTER 1923, p. 248, Pl. 3, figs. 5–7, Pl. 4, fig. 1: as *Proboscidactyla polynema*; Departure Bay, Vancouver. RUSSELL 1938*b*, pp. 412, 413, 416, 425, figs. 2, 3: possibly belongs to family Williidae; Firth of Clyde, Scotland; Plymouth. KRAMP 1947, p. 56, table. RUSSELL 1953, p. 394, text-figs. 257–62. KRAMP 1959*a* pp. 179, 215, 216, 218, 271, fig. 258: diagnosis; distribution.

Genus ***Proboscidactyla*** Brandt 1835 *

Proboscidactylidae with clusters of nematocysts on the exumbrella between the tentacles; with gonads extending on to radial lobes of stomach; with 4–6 or more branched radial canals; usually without a ring canal.

Type-species: *P. flavicirrata* Brandt.

BRANDT 1835, p. 28: *Proboscidactyla* n.g. FORBES 1846, p. 268: *Willsia* n.g. L. AGASSIZ 1862, p. 346: *Willia.* STECHOW 1923, p. 84: states the name *Willsia* instead of *Willia.*

Proboscidactyla abyssicola Uchida 1947

20 mm wide, 10 mm high; 20 radial canals, some bifurcated. Ring canal present; gonads extending along proximal half of all radial canals. No tentacles.

UCHIDA 1947*b*, p. 335, fig. 3: *Proboscidactyla abyssicola* n.sp.; Sagami Bay, Japan.

Proboscidactyla brooksi (Mayer 1910)

Size unknown; stomach three-rayed at centre, but each ray forks; six primary radial canals with 24 terminal branches; ring canal present? 24 tentacles. Probably = *P. stellata.*

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* See Addenda, p. 445.

MAYER 1910, p. 194, fig. 101*a*, C-F: as *Willsia brooksi* n.sp.; North Carolina, east coast of N. America. VANNUCCI 1957*d*, pp. 68, 69. KRAMP 1959*a*, p. 178: probably = *P. stellata.*

Proboscidactyla flavicirrata Brandt 1835

12 mm wide, 10 mm high; four primary radial canals, 54–70 or more terminal branches and same number of short tentacles; no ring canal.

BRANDT 1835, p. 28: *Proboscidactyla flavicirrata* n.g., n.sp.; Kamchatka, North Pacific. HAECKEL 1879, pp. 159, 160: as *P. flavicirrata* and *brevicirrata.* MAYER 1910, p. 189. HARTLAUB 1917, p. 366, text-figs. 312–15. FOERSTER 1923, p. 247: Vancouver. KRAMP 1928, p. 62: variation; Vancouver. THIEL 1932*a*, p. 140. THIEL 1932*b*, pp. 441 ff.: distribution. UCHIDA 1938*b*, p. 40: as *Willsia flavicirrata*; Japan. UCHIDA 1938*c*, p. 51, text-fig. 3: as *W. flavicirrata.* UCHIDA & OKUDA 1941, pp. 431–40: medusae reared from the hydroid *Lar.* NAUMOV 1956*b*, p. 37. VANNUCCI 1957*d*, p. 69. CHOW & HUANG 1958, pp. 185, 189, Pl. 5, fig. 40: Chefoo, China.

Proboscidactyla furcata (Haeckel 1879)

Probably a damaged specimen of *P. stellata.*

HAECKEL 1879, p. 158: as *Willia furcata* n.sp.; St Nazaire, Atlantic coast of France. MAYER 1910, p. 193: ? = *W. stellata.* HARTLAUB 1917, p. 379: ? = *W. stellata.*

Proboscidactyla mutabilis (Browne 1902)

6 mm wide and high, slightly conical, apex very thick; stomach with usually eight, but frequently six radial lobes, irregularities frequent; mouth with closely folded lips; six or eight primary radial canals, 24–54 terminal branches; no ring canal; as many tentacles as branches of radial canals.

BROWNE 1902, p. 280: as *Willia mutabilis* n.sp.; Falkland Islands, southern Atlantic. MAYER 1910, p. 194: as *Willsia mutabilis.* ?VANHÖFFEN 1913*b*, p. 7, fig. 2: as *Willia mutabilis*; Punta Arenas, Strait of Magellan. THIEL 1938*c*, p. 302: as *Willsia mutabilis*; Patagonian Bank; Puerto Madryn, Patagonia. BROWNE & KRAMP 1939, p. 302, Pl. 14, figs. 8, 9, Pl. 17, figs. 10–12, Pl. 19, fig. 12, text-figs. 2–12: as *Willia mutabilis*; discussion of systematic position; Falkland Islands. KRAMP 1957*a*, pp. 41, 96, 124: *P. mutabilis*; variation; coast of southern Patagonia; Falkland Islands. VANNUCCI 1957*d*, p. 69. KRAMP 1958*b*, p. 367: *Proboscidactyla mutabilis* Nair 1951 = *P. ornata.* KRAMP 1959*a*, pp. 178, 235, fig. 257: diagnosis; distribution.

Proboscidactyla occidentalis (Fewkes 1889)

Size? Pyriform, jelly thick; four primary radial canals, 20 terminal branches; 20 tentacles; nematocyst tracks with only one cluster of nematocysts. Probably = *P. flavicirrata* juv.

FEWKES 1889, p. 109, Pl. 5, fig. 3: as *Willia occidentalis* n.sp.; California. BROWNE

1905*a*, p. 726: *Proboscidactyla occidentalis.* MAYER 1910, p. 193: ? = young stage of *P. flavicirrata.* HARTLAUB 1917, p. 366: ? *P. flavicirrata.* FOERSTER 1923, p. 248. VANNUCCI 1957*d*, p. 69. KRAMP 1959*a*, p. 177: probably = *P. flavicirrata.*

Proboscidactyla ornata (McCrady 1857)

5 mm wide, slightly higher than a hemisphere, jelly thick and rigid; stomach normally with four radial lobes, mouth with four recurved, crenulated lips; normally four primary radial canals, 16–20 (rarely more) terminal branches and as many tentacles; no ring canal; medusa buds may arise from corners of stomach or forkings of radial canals.

MCCRADY 1857, p. 149, Pl. 9, figs. 9–11: as *Willsia ornata* n.sp.; Charleston Harbour, S. Carolina, U.S.A. HAECKEL 1879, pp. 152, 157: as *Dyscannota dysdipleura* and *Willetta ornata.* FEWKES 1882*b*, p. 300, Pl. 1, fig. 24: as *Willia gemmifera* n.sp.; east coast of N. America. BROWNE 1905*a*, p. 726: *Proboscidactyla ornata*; p. 728, Pl. 54, figs. 1, 2: as *P. varians* n.sp.; Maldive Islands, Indian Ocean; p. 727: as *P. tropica*; Louisiade Islands, North Pacific. MAAS 1905, p. 21, Pl. 4, figs. 24–8: as *P. flavicirrata* var. *stolonifera* nov. var. MAYER 1910, p. 189, Pl. 20, figs. 1–10, text-fig. 100: *P. ornata*; east coast of N. America from New England to the Bahamas; p. 191, fig. 101: as *P. ornata* var. *stolonifera*; agrees with Bigelow 1909, that the variety is identical with *P. tropica* Browne 1905; (Malay Archipelago; Acapulco, Mexico); p. 192, Pl. 21, figs. 1–3, text-fig. 101*a*: as *P. ornata* var. *gemmifera*; North Carolina to Bahamas, east coast of U.S.A.; p. 194: as *Willsia* (?) *varians* (Browne 1905*a*). ?NEPPI 1912, p. 724: Adriatic Sea. ?NEPPI & STIASNY 1912, p. 557: Trieste, Adriatic Sea. ?NEPPI & STIASNY 1913*b*, p. 57, Pl. 2, fig. 24, Pl. 3, fig. 25; Trieste, Adriatic Sea. VANHÖFFEN 1913*a*, p. 419: as *P. ornata* var. *gemmifera*; Florida. BIGELOW 1914*b*, p. 11: New England, east coast of U.S.A. BROWNE 1916*a*, p. 184: as *P. tropica*; Amirante Islands, Indian Ocean. HARTLAUB 1917, p. 368, figs. 316–23: *P. ornata,* = *Willia gemmifera* Fewkes and *P. tropica* Browne; ? = *P. ornata* Neppi 1912 and Neppi & Stiasny 1913, ? = *P. varians* Browne. FOERSTER 1923, p. 248: as *P. ornata* var. *stolonifera*; report of Bigelow 1909*a*. UCHIDA 1925*b*, p. 87, fig. 12: Japan. UCHIDA 1927*a*, p. 234, fig. 15: Japan; p. 235: *P. ornata* var. *gemmifera* = *P. ornata* var. *stolonifera* Bigelow 1909*a*; p. 237, fig. 47: as *Misakia typica* n.g., n.sp.; Misaki, Japan. MENON 1932, p. 12, Pl. 2, fig. 18: *P. ornata*; Madras, India; p. 13, Pl. 2, figs. 12, 13: as *P. conica* n.sp.; Madras. RANSON 1937, p. 322: as *P. flavicirrata* var. *stolonifera*; cnidactines. THIEL 1938*c*, p. 301: east of Rio Grande do Sul; Rio de Janeiro, Brazil; Fernando Po, W. Africa. UCHIDA & OKUDA 1941, pp. 431–40: as *P. typica.* KOMAI & YAMAZI 1945, p. 5, fig. 6: as *Misakia typica*; Japan. BERRILL 1950, p. 310, fig. 8, J. K: as *P. ornata* var. *gemmifera* and *stolonifera.* KOMAI 1951, p. 75: as *Misakia typica.* NAIR 1951, p. 57: *P. ornata*; Trivandrum coast, India; p. 57: as *P. varians,* ? = *mutabilis.* VANNUCCI 1951*b*, pp. 112, 115, 116: Brazil. KRAMP 1952, p. 10: Chile. KRAMP 1953, p. 299: N.E. Australia. CHIU 1954*a*, pp. 41, 42, Pl. 8, figs. 26, 27: Amoy, China. CHIU 1954*b*, pp. 50, 52, 55: China. KRAMP 1955*a*, p. 269: Gulf of Guinea and off mouth of Congo, W. Africa. KRAMP 1957*a*, p. 13, Pl. 3, fig. 7: asexual reproduction in comparison with *Bougainvillia platygaster.* VANNUCCI 1957*d*, pp. 67, 91, 96, 97, 99, 101, figs. 16, 17 (map and diagram): Brazil. GANAPATI & NAGABHUSHANAM 1958, pp. 92, 94: as *P. mutabilis*; Vizagapatam coast, India. KRAMP 1958*b*, p. 367: *P. conica* = *ornata*; Nicobars, Indian Ocean. YAMAZI 1958, p. 136: as *P. ornata, P.o.* var. *gemmifera,* and *P. typica*; Tanabe Bay, Japan. KRAMP 1959*a*, pp. 8, 178, 211, 227, 232, 234, 270, fig. 255: diagnosis; distribution.

Proboscidactyla pacifica (Maas 1909)

5–7 mm wide, 2–3 mm high, flattened. Six primary radial canals, 96–108 terminal branches; ring canal rudimentary; as many tentacles as terminal branches of radial canals; nematocyst tracks short. ?=*P. flavicirrata.*

Maas 1909, p. 17, Pl. 3, fig. 16: as *Willia pacifica* n.sp.; Japan. Mayer 1910, p. 723: as *Willsia pacifica.* Hartlaub 1917, p. 379, fig. 329: as *Willia pacifica.* Uchida 1927*a*, p. 236: as *Willia pacifica.* Uchida 1930, p. 334: as *Willsia pacifica,* probably different from *W. stellata.* Uchida 1938*b*, p. 40: as *Willsia flavicirrata.* Uchida 1938*c*, p. 51: as *Willsia flavicirrata.* Kramp 1959*a*, p. 177: probably =*Proboscidactyla flavicirrata.*

Proboscidactyla stellata (Forbes 1846)

9 mm wide, 8 mm high, jelly thick, evenly rounded; stomach normally with six radial lobes; mouth with six folded lips; six primary radial canals, up to 24 terminal branches; no ring canal; up to 24 short tentacles with adaxial basal nematocyst cushions.

Forbes 1846, p. 268: as *Willsia stellata* n.sp.; England. Haeckel 1879, p. 158: as *Willia stellata.* Mayer 1910, p. 193: as *Willsia stellata*; (Great Britain). Hartlaub 1917, p. 374, text-figs. 324–8: as *Willia stellata,* =*W. cornubica* Peach 1867. Lebour 1917, p. 161: as *Willsia stellata*; Plymouth. Dick 1919, p. 91: as *Lar sabellarum*; Firth of Clyde, Scotland. Lebour 1923, p. 81, fig. 5: as *Willsia stellata*; food. Kramp & Damas 1925, p. 286: as *Willsia stellata*; Norway. Marshall 1925, p. 127: as *Willia stellata*; Clyde, Scotland. Uchida 1925*b*, p. 88: as *Willia stellata,* non =*pacifica* Maas; Japan. Uchida 1927*a*, p. 235: as *Willia stellata*; Japan. Kramp 1930, p. 19: as *Willsia stellata*; off Thames estuary; Newhaven, English Channel. Uchida 1930, p. 334: as *Willsia stellata*; Mutsu Bay, Japan. Ranson 1932*a*, p. 1000: as *Willia stellata.* Ranson 1936*b*, p. 101: discussion of the family Williadae. Kramp 1937*b*, p. 74, fig. 30: as *Willia stellata.* Ranson 1937, pp. 321–3, fig. 1: as *Willia stellata*; on cnidactines and cnidothylacies. Russell 1938*b*, pp. 413, 416: as *Willia stellata*; Plymouth. Russell 1938*d*, p. 154, fig. 45: as *Willia stellata*; nematocysts. Uchida 1938*c*, p. 51. Kramp 1939*b*, pp. 503–9, figs. 1–5: refers Williidae to Limnomedusae. Kramp 1947, p. 56, table: as *Willia stellata.* Russell 1953, p. 386, Pl. 23, figs. 3, 4, text-figs. 250–6: *Proboscidactyla stellata*; British coasts. Rees 1953*a*, p. 8: Herdlafjord, Norway. Chiu 1954*b*, p. 56: as *Willia stellata.* Vannucci 1957*d*, pp. 68, 69. Chow & Huang 1958, pp. 186, 189, Pl. 5, fig. 39: Chefoo, China. Kramp 1959*a*, pp. 178, 215, 218, 222, 223, 271, fig. 256: diagnosis; distribution.

Order TRACHYMEDUSAE

Hydromedusae with umbrella margin entire and not divided into lobes; with thickened marginal nematocyst ring; with radial canals; with gonads usually confined to radial canals; with solid marginal tentacles, or with both solid and hollow tentacles, situated on the margin of the umbrella; with sensory clubs with endodermal axis which may be free or enclosed.

Family *GERYONIIDAE*

Trachymedusae with stomach with peduncle; with four or six radial canals; with centripetal canals; with flattened leaf-shaped gonads on radial canals; with marginal tentacles of two kinds, hollow and solid; with marginal sensory clubs enclosed in mesogloea.

Genus ***Geryonia*** Péron & Lesueur 1809

Geryoniidae with six radial canals and six gonads.

Type-species: *G. proboscidalis* (Forskål).

ESCHSCHOLTZ 1829, p. 86: *Geryonia* HAECKEL 1879, pp. 293, 294, 296, 297: as *Geryones, Geryonia, Carmaris* and *Carmarina.* MAYER 1910, p. 424.

Geryonia proboscidalis (Forskål 1775)

35–80 mm wide, almost hemispherical, jelly moderately thick; stomach small, on long conical peduncle; mouth with six simple lips; up to seven centripetal canals in each space between the six radial canals; gonads heart-shaped, very broad above; six long, hollow perradial tentacles with nematocyst rings, and six small, solid interradial tentacles with adaxial nematocyst clusters; 12 statocysts.

FORSKÅL 1775, p. 108, Pl. 36, fig. 1: as *Medusa proboscidalis* n.sp. PÉRON & LESUEUR 1809, p. 329: *Geryonia hexaphylla* n.g., n.sp. ESCHSCHOLTZ 1829, p. 88: *Geryonia proboscidalis.* MAYER 1910, p. 425, Pl. 53, figs. 1–3, Pl. 54, fig. 10, text-fig. 282: synonyms; (Mediterranean and tropical parts of Atlantic, Indian and Pacific oceans). VANHÖFFEN 1912, p. 373: central Indian Ocean; S.E. of Ascension, tropical Atlantic. BIGELOW 1913, p. 56: E. of Kiushiu Island, Japan. NEPPI & STIASNY 1913*b*, p. 81: Trieste, Adriatic Sea. BIGELOW 1915*b*, p. 316: off Delaware Bay, New England, U.S.A. BROWNE 1916*a*, p. 199: Indian Ocean: N.W. of Chagos; Chagos Archipelago; Mauritius. BIGELOW 1918, p. 390: Straits of Florida. BIGELOW 1919, p. 325: Philippines. NEPPI 1919, p. 123, fig. 7: abnormal specimen; Naples, Italy. NEPPI 1920*b*, p. 90, fig. 4: abnormal specimen; Naples. SCHMIDT 1920, pp. 456–72, Pl. 13: as *Carmarina hastata* HAECKEL; histology. ALVARADO 1923*a*, pp. 167–73, fig. 1: as *C. hastata*; histology. ALVARADO 1923*b*,

p. 34, Pl. 7: as *C. hastata*; histology. FOERSTER 1923, p. 267. KRAMP 1924, p. 34, fig. 29: morphological remarks; Mediterranean. RANSON 1925*b*, p. 382: near Tunis, N. Africa. SLONIMSKY 1926, p. 926: as *C. hastata*; French Mediterranean coast. WEILL 1926*b*, p. 1357, fig. 1*a*, *b*: as *C. hastata*; nematocysts. UCHIDA 1928*b*, p. 83, fig. 4: Japan. BROCH 1929, p. 522, fig. 30. WEILL 1935*c*, p. 65, fig. IV A: as *C. hastata*; parasitism. DAWYDOFF 1936, p. 469: Indochina. RANSON 1936*b*, p. 191: between Canary Islands and Azores. THIEL 1936*b*, p. 53, map: southern Atlantic. BIGELOW 1938, p. 127: Bermudas. UCHIDA 1938*a*, p. 147: Amakusa, Japan. VERESS 1938, pp. 153–70: as *Carmarina*; movements. UCHIDA 1947*b*, p. 340: Japan. KRAMP 1948*b*, p. 14: near Canary Islands. MOORE 1949, p. 8: Bermudas. BERRILL 1950, p. 296, fig. 1 G–H: development, report. VANNUCCI 1951*b*, pp. 107, 112, 114: Brazil. KRAMP 1953, p. 301: N.E. Australia. CHIU 1954*b*, p. 55: as *G. hastata* and *proboscidalis*. BLACKBURN 1955, p. 413: S.E. Australian waters. KRAMP 1955*a*, p. 275: S. of Canary Islands; off Liberia. KRAMP 1957*a*, pp. 62, 125: S.E. of and E. of Africa; off east coast of Brazil. VANNUCCI 1957*d*, pp. 73, 93, 99, 102: Brazil. YAMAZI 1958, p. 137: Tanabe Bay, Japan. KRAMP 1959*a*, pp. 60, 192, 242, 244, 249, fig. 292: Atlantic; Mediterranean (new records); diagnosis; distribution.

Genus ***Liriope*** Lesson 1843

Geryoniidae with four radial canals and four gonads.

Type-species: *L. tetraphylla* (Chamisso & Eysenhardt)

LESSON 1843, p. 332: *Liriope* n.g. HAECKEL 1879, pp. 286, 288, 292: as *Liriantha, Liriope, Glossoconus* and *Glossocodon*. MAYER 1910, p. 410. BIGELOW 1913, p. 54. BROWNE 1916*a*, p. 197. BROCH 1929, p. 515: key to the species *L. exigua, tetraphylla, conirostris, catharinensis* and *scutigera*. RANSON 1936*b*, p. 188: *L. exigua, eurybia* and *tetraphylla*. THIEL 1936*b*, p. 45: *L. tetraphylla* the only species. BIGELOW 1938, p. 126: discussion. RANSON 1949, p. 131: discussion.

Liriope tetraphylla (Chamisso & Eysenhardt 1821)

10–30 mm wide, almost hemispherical, jelly thick; stomach small, on peduncle of varying length; mouth with four simple lips; radial canals broad; 1–3 (or more) centripetal canals in each quadrant; gonads of very variable shape and size; four long, hollow perradial tentacles with nematocyst rings, and four small, solid interradial tentacles with adaxial nematocyst clusters; eight statocysts.

CHAMISSO & EYSENHARDT 1821, p. 357, Pl. 27, fig. 2: as *Geryonia tetraphylla* n.sp. LESSON 1843, p. 332: as *Liriope cerasiformis* n.g., n.sp. GEGENBAUR 1856, p. 257: *L. tetraphylla* and as *L. exigua* and *rosacea*; p. 257, Pl. 8, fig. 17: as *L. mucronata* n.sp. MCCRADY 1857, p. 208: as *L. scutigera* n.sp.; Carolina, U.S.A. MÜLLER 1859*a*, pp. 310, 316, Pl. 11: as *L. catharinensis* n.sp.; coast of Brazil. HAECKEL 1864, pp. 329, 462, P. 12, figs. 11–25: as *L. eurybia* n.sp.; Mediterranean. HAECKEL 1879, p. 291: as *L. conirostris* n.sp.; east coast of U.S.A.; p. 292: as *Glossoconus canariensis* n.sp.; Canary Islands; p. 293: as *Glossocodon agaricus* n.sp.; New Zealand; p. 293, Pl. 18, fig. 5: as *Glossocodon lütkenii* n.sp.; Azores. GOETTE 1886, p. 833: as *Glossonia haeckelii* n.sp.; East Africa. MAAS 1893, p. 36, Pl. 3, figs. 4–7: as *L. distanogona* n.sp.; Atlantic; p. 37, Pl. 2, figs. 8, 10, Pl. 4, figs. 1, 2: as *L. minima*; tropical Atlantic; p. 38, Pl. 2, fig. 4: as *L. hyperbolica*; Florida. BIGELOW 1904, p. 258, Pl. 5, figs. 17, 18: as *L. indica* n.sp.; Indian Ocean. Mayer 1910, p. 413, Pl. 52, figs. 2–4, Pl. 53, fig. 4, text-figs. 263–6; as *L. exigua*; warmer parts of Atlantic; Mediterranean; p. 414, text-fig. 267: as *L. exigua* var. *mucronata*; Mediterranean; p. 416, text-fig. 268: as *L. hyperbolica*; p. 417, Pl. 52, fig. 1, text-figs. 269, 270: as *L. rosacea*; Brazil; Florida; Malay Archipelago; p. 418, Pl. 53, fig. 4, text-figs. 273, 273*a*; *L. tetraphylla*: Pacific and Indian Oceans; p. 418: as *L. agaricus* and *canariensis*; p. 418, text-fig. 272: as *L. lütkenii*; p. 419, Pl. 51, fig. 2: as *L. conirostris*; p. 420, Pl. 51, figs. 3, 4, text-figs. 274, 275: as *L. eurybia*; p. 420, text-fig. 276: as *L. distanogona*; p. 421, Pl. 50, figs. 1–6, text-fig. 277: as *L. catharinensis*; Brazil; West Indies; southern New England; p. 421: as *L. indica* and *haeckelii*; p. 421, Pl. 50, figs. 7–10, Pl. 51, fig. 1, text-figs. 278, 280: as *L. scutigera*; Bahamas; east coast of U.S.A.; p. 424, text-fig. 281: as *L. minima*; p. 497: as *L. rosacea* and *haeckeli*. Neppi 1912, p. 731: as *L. eurybia*; Adriatic Sea. Vanhöffen 1912, p. 373: Atlantic Ocean; Cape Verde Islands; Port Natal, S.E. Africa. Bigelow 1913, p. 55: Japan. Neppi & Stiasny 1913*b*, p. 80: as *L. eurybia*; Trieste. Vanhöffen 1913*a*, p. 428: Tortugas, Florida. Vanhöffen 1913*b*, p. 28: Gibraltar; Brazil; west coast of S. America; Galapagos Islands; Honolulu to Philippines; Hong Kong, China. Bigelow 1914*b*, p. 21: as *L. scutigera*; Newport; *L. tetraphylla*; east coast of U.S.A. Bigelow 1915*b*, p. 316: as *L. scutigera*; Newport, east coast of U.S.A. Mayer 1915*a*, p. 160: as *L. rosacea*; Torres Strait, Australia. Browne 1916*a*, p. 198: Indian Ocean: Chagos Archipelago; Saya de Malha Banks; Cargados Carajos; Mauritius; Farquhar group; between Providence Island and Alphonse Islands; Alphonse Islands; Amirante Islands. Bigelow 1917, p. 306: *L. tetraphylla* and as *L. scutigera*; off Georges Bank, east coast of U.S.A. Bigelow 1918, p. 389: *L. tetraphylla*; Straits of Florida; as ?*L. scutigera*; Straits of Florida; N. of Bahama Bank. Pell 1918, pp. 22, 30, fig. 5: as *L. eurybia*; Adriatic Sea. Bigelow 1919, p. 325: Philippines. Bigelow 1922, p. 159: *L. tetraphylla* and as *L. scutigera*; off Chesapeake Bay, east coast of U.S.A. Foerster 1923, p. 267: *L. tetraphylla*; Pacific coast of California and Central America; as *L. indica* and *rosacea*. Kramp 1924, p. 30, fig. 25: as *L. exigua*; western Mediterranean; p. 31, fig. 27, map: as *L. eurybia*; Bay of Cadiz, Spain; Mediterranean; biology; p. 31, fig. 26: as *L. mucronata*; western Mediterranean. Ranson 1925*a*, p. 90: *L. tetraphylla*; S.W. of Portugal; p. 90: as *L. rosacea*; N.W. and W. of Madeira; p. 90: as *L. exigua*; N.W. of Madeira; p. 91; as *L. minima*; N.W. of Madeira; p. 91: as *L. mucronata*; N.W. of Madeira. Ranson 1925*b*, p. 382: as *L. euribia, mucronata* and *exigua*; off coast of Portugal, off Atlantic coast of Morocco and Mediterranean Sea with adjacent Atlantic Ocean. Bigelow 1926, p. 54: as *L. scutigera*; off Gulf of Maine, U.S.A. Fish 1926, p. 124: as *L. scutigera*; Woods Hole, east coast of U.S.A. Ranson 1926, p. 301, fig.: as *L. scutigera*; English Channel. Weill 1926*b*, p. 1358, fig. 3: as *L. eurybia*; nematocysts. Uchida 1927*b*, p. 225: Japan. Uchida 1928*b*, p. 82, fig. 3: Japan. Broch 1929, p. 516, fig. 25: as *L. exigua*; p. 518, fig. 26: *L. tetraphylla*; p. 519, fig. 27: as *L. conirostris*; p. 520, fig. 28: as *L. catharinensis*; p. 521, fig. 29: as *L. scutigera*; distribution. Cowles 1930, p. 331: as *L. scutigera*; Chesapeake Bay, east coast of U.S.A. Mar. Biol. Ass. 1931, p. 83: as *L. exigua*; Plymouth. Menon 1931, p. 503: Madras, India. Candeias 1932, p. 4, Pl. 1, figs. 2–4: as *L. cerasiformis*; Portugal. Menon 1932, p. 28: Madras, India. Russell 1933, tab. I: Plymouth. Lele & Gae 1935, p. 97: Bombay, India. Russell 1935*b*, pp. 317, 318: as *L. exigua*; English Channel. Thiel 1935*b*: southern Atlantic. Dawydoff 1936, p. 469: Indochina. Ranson 1936*b*, p. 189: as *L. exigua*; round the Azores; p. 190, map: *L. tetraphylla*; tropical and southern Atlantic; p. 190: as *L. eurybia*; off Portugal; Bay of Biscay; Spanish Mediterranean coast. Thiel 1936*b*, p. 45, map: all other species of *Liriope* synonymous with *L. tetraphylla*; tropical and southern Atlantic. LING 1937, p. 360, figs. 15–18: Chekiang coast, China. BIGELOW 1938, p. 127: Bermudas. PELL 1938, p. 927: as *L. eurybia*; Adriatic Sea. RUSSELL 1938*b*, pp. 413, 416, 417, 419, 437: as *L. exigua*; Plymouth. UCHIDA 1938*a*, p. 147: Japan. UCHIDA 1938*b*, p. 43: Japan. BIGELOW & SEARS 1939, p. 366: as *L. scutigera*; off Chesapeake Bay, east coast of U.S.A. RUSSELL 1939*a*, p. 181: '*L. tetraphylla* (=*exigua*).' BIGELOW 1940, p. 302: Pacific coast of Panama. CARVALHO 1941, p. 105, Pl. figs. 1–3: coast of Brazil near São Paulo. MENON 1945, p. 41: Trivandrum coast, India. KRAMP 1947, p. 32: as *L. eurybia*; northern Atlantic to about 50° N. UCHIDA 1947*a*, p. 314: Palao Islands; Sulu Sea; China Sea. UCHIDA 1947*b*, p. 340: Japan. BABNIK 1948, p. 44, fig. 9: variation in shape of gonads; Adriatic Sea; pp. 70, 71: biology. KRAMP 1948, p. 10: as *L. exigua*; between Canary Islands and Cape Verde Islands; p. 14: as *L. eurybia*; Cadiz Bay; N.W. Africa; S.W. of the Azores. MOORE 1949, p. 9: Bermudas. RANSON 1949, pp. 132, 133: *L. tetraphylla*; as *L. exigua*, considered a valid species; tropical Atlantic. BERRILL 1950, p. 296: as *L. scutigera*; development. ROSSI 1950, p. 27: as *L. eurybia*; Golfo di Rapallo, Italy. NAIR 1951, p. 70: Trivandrum coast, India. VANNUCCI, 1951*a*, p. 91, Pl. 3, fig. 24: Brazil. VANNUCCI 1951*b*, pp. 111, 115, 117: Brazil. DEEVEY 1952*b*, pp. 150, 151: as *Liriope* sp.; Block Island Sound, Conn., U.S.A. BAL & PRADHAN 1952, p. 76: Bombay, India. BLACKBURN 1953, p. 414: S.E. Australian waters. GEORGE 1953, p. 82: Calicut, southern India. KRAMP 1953, p. 301: N.E. Australia. RUSSELL 1953, p. 419, Pl. 24, fig. 2, text-figs. 275–82: English Channel. CHIU 1954*a*, pp. 41, 46, Pl. 4, fig. 17: Amoy, China. CHIU 1954*b*, pp. 51, 52, 55: China. CHU & CUTRESS 1954, p. 9: as *Liriope* sp.; cause of dermatitis; Hawaii. LUBET 1954, p. 213: as *Liriope*; Arcachon, France. BERNARD 1955*b*, p. 13: Bay of Algier, Morocco. HURE 1955, pp. 6, 7: as *L. eurybia*; Adriatic Sea. KRAMP 1955*a*, p. 275: W. coast of Africa between Canary Islands and Angola; p. 308, 309: =*L. cerasus* and *Glossoconus canariensis* Haeckel from Canary Islands; = several species of *Liriope*, Maas 1893 from N.W. Africa; p. 310: =*L. exigua* Kramp 1948. KRAMP 1955*b*, p. 159: by Haeckel 1879 determined as *L. rosacea, crucifera* n.sp., and *Glossocodon lütkeni* n.g., n.sp. KRAMP 1956*a*, p. 4: eastern tropical Pacific. ALVARIÑO 1957*a*, p. 15: western Mediterranean. ALVARIÑO 1957*b*, p. 24: Atlantic coast of Spain and Portugal. KRAMP 1957*a*, pp. 63, 110 ff., 125: W. of Cape of Good Hope; tropical west coast of Africa; from Cape Verde Islands along east coast of S. America to Buenos Aires; E. Africa from Mozambique to Somaliland; coast of Peru; N.E. of South Sandwich Islands. VANNUCCI 1957*d*, pp. 70, 93, 96, 97, 98, 99, 101, 102, figs. 18, 19 (map and diagram); Brazil. KRAMP 1958*a*, p. 125: Villefranche, Mediterranean. KRAMP 1958*b*, p. 368: the Nicobars; Mergui Archipelago; Orissa coast; Vizagapatam, India. GANAPATI & NAGABHUSHANAM 1958, p. 93: Vizagapatam coast, India. UCHIDA 1958, p. 164: Sado, Japan. YAMAZI 1958, p. 137: Tanabe Bay, Japan. KRAMP 1959*a*, pp. 58, 193, 242–6, 250, 252, fig. 293: Atlantic; Mediterranean (new records); diagnosis; distribution. KRAMP 1959*b*, p. 11. West Africa.

Family *PTYCHOGASTRIIDAE*

Trachymedusae with marginal tentacles grouped into more or less well defined clusters; some tentacles with adhesive disks; with eight radial canals; stomach eight-lobed, with eight mesenterial partitions; gonads on the sides of the eight stomach lobes or on radial canals adjacent to stomach lobes; with free sensory clubs. (See below, *Tesserogastria*.)

Genus ***Ptychogastria*** Allman 1878

With the characters of the family.

Type-species: *P. polaris* Allman.

ALLMAN 1878, p. 290: *Ptychogastria* n.g. HAECKEL 1879, pp. 265, 266, 267: as *Pectyllis* n.g., *Pectis* n.g. and *Pectanthis* n.g.

Ptychogastria antarctica (Haeckel 1879)

Doubtful species, probably not belonging to *Ptychogastria.*

HAECKEL 1879, p. 266: as *Pectis antarctica* n.sp.; Kerguelen Island, Antarctic. HAECKEL 1881, p. 15, Pls. 5, 6, text-figs. 1–20: as *Pectis antarctica.* MAAS 1906*c*, p. 493: belongs to *Ptychogastria.* MAYER 1910, p. 375: *Ptychogastria antarctica.* THIEL 1932*b*, p. 478. KRAMP 1947, p. 5: probably not belonging to *Ptychogastria.* KRAMP 1957*a*, p. 46: the type-specimen in British Museum is mutilated, probably no *Ptychogastria.*

Ptychogastria asteroides (Haeckel 1879)

4–5 mm wide, flatter than a hemisphere, with fairly thin jelly and a small, sharply pointed, apical projection; exumbrella with 16 radiating ridges; eight egg-shaped gonads on proximal 1/3 of radial canals adjacent to stomach; 16 isolated tentacles and 16 clusters of tentacles (? hollow) most of them with adhesive organs; 16 statocysts.

HAECKEL 1879, p. 267: as *Pectanthis asteroides* n.sp.; Pola, Adriatic Sea. HAECKEL 1881, p. 20, Pls. 7, 8: as *Pectanthis asteroides*; Straits of Gibraltar. MAAS 1906*c*, p. 492: *Ptychogastria asteroides.* MAYER 1910, p. 374. THIEL 1932*b*, p. 478. KRAMP 1947, p. 5: remarks. PICARD 1955*a*, p. 68: occasionally found at Villefranche-sur-Mer, Mediterranean coast of France. KRAMP 1957*a*, p. 46. KRAMP 1959*a*, pp. 180, 205, 223, 226: diagnosis; distribution.

Ptychogastria polaris Allman 1878

18–22 mm wide, hemispherical or somewhat conical, exumbrella with 16 radiating ridges; velum very wide; stomach about half as long as bell cavity, eight-rayed above, mouth with four lips; 16 separated gonads along the sides of the eight stomach lobes; about 48 clusters of solid tentacles (in adult), each cluster with three filiform tentacles and numerous tentacles with adhesive organs; 16 statocysts.

ALLMAN 1878, p. 290, three text-figs.: *Ptychogastris polaris* n.g., n.sp. HAECKEL 1879, p. 266: as *Pectyllis arctica* n.sp.; Halifax, Nova Scotia; west coast of Greenland. HAECKEL 1881, p. 11, Pls. 3, 4: as *Pectyllis arctica.* MAYER 1910, p. 372, text-fig. 212: *Ptychogastria polaris*; (Spitzbergen; north of Norway and Russia). VANHÖFFEN 1912, p. 386, Pl. 25, fig. 6, text-fig. 20: as *Ptychogastria opposita* n.sp.; Gauss Station, Antarctic. BIGELOW 1913, p. 41: Bering Sea. KRAMP 1914, p. 427: west and east coast of Greenland. FOERSTER 1923, p. 264: report of Bigelow. KRAMP & DAMAS 1925, p. 316: Norway. TANASIJČUK 1927, p. 362: Barents Sea.

BROCH 1929, p. 491, fig. 6*a*, *b*: distribution. RUNNSTRÖM 1932, p. 30: Hjelte- and Herdlafjord, Norway. THIEL 1932*a*, p. 151. THIEL 1932*b*, pp. 444 ff.: distribution in Arctic. BERNSTEIN 1934, pp. 9, 25: Kara Sea. YASHNOV 1939, p. 112: Kara Sea; Laptev Sea. DUNBAR 1942, p. 74: Lake Harbour in Hudson Strait. KRAMP 1942, p. 69: west coast of Greenland. KRAMP 1943, p. 6: east coast of Greenland. KRAMP 1947, p. 4, Pl. 1, figs. 1–4, Pl. 6, figs. 1, 2, map: distribution; p. 5: as *P. opposita*. YASHNOV 1948, p. 73, Pl. 21, fig. 1*a*, *b*: north of U.S.S.R. VIBE 1950, p. 103: N.W. Greenland. REES 1953*a*, p. 8: Herdlafjord, Norway. CHIU 1954*b*, p. 56. KRAMP 1955*b*, p. 158: by Haeckel 1879 determined as *Pectyllis arctica*. NAUMOV 1956*b*, p. 38. KRAMP 1957*a*, pp. 45, 98, 99: *P. opposita* = *P. polaris*; South Shetland Islands, Antarctic. KRAMP 1959*a*, pp. 180, 205, 208–11, 215, 221, 264, 268, 269, fig. 260: diagnosis; distribution.

Genus **_Tesserogastria_** Beyer 1959

Ptychogastriidae with great number of solid tentacles inserted at varying distances from the velum; manubrium simple, without peduncle, mesenteries, or pouches; with eight gonads attached along the manubrium.

Type-species: *T. musculosa* Beyer 1959.

Tesserogastria musculosa Beyer 1959

About 2 mm wide and high, bell-shaped, jelly rather thin with slightly thickened apex; up to about 300 tentacles inserted at three to five different levels, not in clusters; velum extremely broad and strong; ring canal broad, no centripetal canals; velum and subumbrella with strong tissue of muscle fibres; stomach extending somewhat beyond bell margin; neither external nor internal septa; gonads arranged in four pairs on both sides of the four edges of the stomach.

BEYER 1959, pp. 121–42, Pls. 1, 2: *Tesserogastria musculosa* n.g., n.sp.; Oslofjord, Norway; bottom-living, in soft bottom.

Family *PETASIDAE*

Trachymedusae with four radial canals; with well developed manubrium; marginal tentacles not in clusters, solid, with a terminal, club-shaped knob of nematocysts; with free sensory clubs.

Genus **_Petasiella_** Uchida 1947

Petasidae with marginal tentacles arising asymmetrically, at unequal intervals.

Type-species: *P. asymmetrica* Uchida.

UCHIDA 1947*a*, p. 310: *Petasiella* n.g.

Petasiella asymmetrica Uchida 1947

Up to 1 mm wide, bell-shaped, jelly moderately thick; stomach small, flask-shaped; gonads small, globular, at distal points of the four radial canals; up to 28 tentacles, irregularly placed, with terminal cluster of nematocysts; four statocysts.

UCHIDA 1947*a*, p. 311, text-figs. 10, 11: *Petasiella asymmetrica* n.g., n.sp.; Palao Islands, central Pacific. KRAMP 1959*c*, p. 256: Nicobar Islands; Malacca; Philippines; Bali.

Genus ***Petasus*** Haeckel 1879

Petasidae with marginal tentacles regularly arranged, at equal intervals.

Type-species: *P. atavus* Haeckel.

HAECKEL 1879, pp. 247–50, 637: as *Petasus* n.g., *Dipetasus* n.g., *Petasata* n.g. and *Petachnum* n.g. MAYER 1910, p. 362: unites all these genera into one, *Petasus*.

Petasus atavus Haeckel 1879

1 mm wide and high; gonads spindle-shaped or band-shaped, along greater part of radial canals; four tentacles; four statocysts.

HAECKEL 1879, p. 248, P. 18, fig. 1: *Petasus atavus* n.g., n.sp.; Smyrna, Asia Minor; p. 248: as *P. tetranema* n.sp.; Canary Islands, W. of Africa. MAYER 1910, p. 361, text-fig. 205: as '*P. atavus*'. KRAMP 1955*a*, p. 307: report of Haeckel, *P. tetranema* =*P. atavus*. KRAMP 1959*a*, pp. 181, 242, 244, 247, 250, fig. 261: diagnosis; distribution.

Petasus digonimus (Haeckel 1879)

1 mm wide and high; two gonads on middle 1/3 of two opposite radial canals; two tentacles; four statocysts. Doubtful species.

HAECKEL 1879, p. 249, Pl. 18, fig. 2: as *Dipetasus digonimus* n.g., n.sp.; Kerguelen Island, Antarctic. MAYER 1910, p. 361, text-fig. 204: as '*Dipetasus digonimus*'.

Petasus eucope (Haeckel 1879)

10 mm wide, 5 mm high; gonads spherical or spindle-shaped; eight tentacles; eight statocysts. Doubtful species.

HAECKEL 1879, p. 249, Pl. 18, fig. 3: as *Petasata eucope* n.g., n.sp.; Red Sea; p. 637: as *Petasata rabbeana*; south of Madagascar. MAYER 1910, p. 361, text-fig. 206: '*Petasata eucope*' probably young of *P. rabbeana*.

Petasus tiaropsis (Haeckel 1879)

10 mm wide, 3 mm high; gonads extending along 2/3 of the radial canals; more than 100 tentacles densely crowded; eight statocysts. Doubtful species.

HAECKEL 1879, p. 250: as *Petachnum tiaropsis* n.g., n.sp.; China Sea. MAYER 1910, p. 361.

Family *HALICREATIDAE*

Trachymedusae with wide, circular stomach; with broad radial canals; with numerous marginal tentacles of different sizes, but all structurally alike and arranged in a single series; each tentacle divisible into a soft, flexible proximal and a stiff, spine-like distal region; with free sensory clubs; with neither peduncle nor proboscis.

Genus **Botrynema** Browne 1908

Halicreatidae with eight radial canals; with 16 groups of tentacles (two groups containing many tentacles in a single row in each octant) and eight solitary perradial tentacles.

Type-species: *B. brucei* Browne.

BROWNE 1908, p. 239: *Botrynema* n.g. MAYER 1910, p. 394. KRAMP 1942, p. 73: discussion of the genus.

Botrynema brucei Browne 1908

Up to about 25 mm wide; the apical jelly is very thick and terminates in a distinct and sharply defined knob; stomach wide, circular and short; gonads oval, on proximal or central halves of radial canals; 11–12 tentacles in each of the 16 groups; usually three statocysts in each interradial space and 1–2 on either side of the solitary perradial tentacles.

?VANHÖFFEN 1902, p. 70, Pl. 9, fig. 3: as *Halicreas glabrum* n.sp.; off west coast of Africa and in central Indian Ocean. BROWNE 1908, p. 239, Pl. 1, figs. 8, 9, Pl. 2, fig. 1: *Botrynema brucei* n.g., n.sp.; Cape Horn, S. America. MAYER 1910, p. 392: as *H. glabrum*; p. 395, text-fig. 248A: as *B. brucei*. VANHÖFFEN 1912, p. 382, Pl. 25, fig. 5, text-figs. 18, 19: Antarctic Sea. BIGELOW 1913, p. 53, Pl. 4, figs. 1–4: as *B. ellinorae*; Bering Sea. FOERSTER 1923, p. 266: as *B. ellinorae* (report of Bigelow). THIEL 1932*b*, p. 477. RANSON 1936*b*, p. 167: *H. glabrum* a distinct species; Azores. THIEL 1936*b*, p. 34: *H. glabrum* and *rotundatum* = *papillosum*. BIGELOW 1938, p. 121: ? as *H. glabrum*; Bermudas; p. 124: discussion. KRAMP 1942, p. 77: *H. glabrum* probably = *B. brucei*, but Vanhöffen's description insufficient; Davis Strait. KRAMP 1947, p. 11, Pl. 1, fig. 9, Pl. 2, fig. 3, Pl. 6, fig. 4, (map): northern Atlantic. KRAMP 1948*b*, p. 6: northern Atlantic. YASHNOV 1952, p. 95: off Kamchatka. RUSSELL 1953, p. 459, Pl. 27, fig. 1, text-figs. 303, 304: west of Ireland. BLACKBURN 1955, p. 420: S. E. Australia. NAUMOV 1956*b*, p. 38. KRAMP 1957*a*, pp. 46, 50, 100, 126, text-fig. 17, map: Cape of Good Hope; Indian Ocean; Weddell Sea; pp. 46, 47, 50, 51: synonyms *Halicreas glabrum* and *rotundatum*. PETERSEN 1957, p. 44: N. Atlantic. KRAMP 1959*a*, pp. 44, 183, 253, 254, 256, 259, 261, 263, 273, fig. 267: Bay of Biscay; off west coast of Africa; near Bermudas and Bahamas; diagnosis; distribution. MOHR 1959: distribution.

Botrynema ellinorae (Hartlaub 1909)

Up to 25 mm wide, evenly rounded without an apical knob; higher than a hemisphere, jelly moderately thick; in all other regards similar to *B. brucei*.

HARTLAUB 1909*c*, p. 468, Pl. 76, figs. 3, 4, 6: as *Alloionema ellinorae* n.g., n.sp.; east of Greenland. KRAMP 1914, p. 428: as *A. ellinorae*, report of Hartlaub. BROCH 1929, p. 510, fig. 20: *Botrynema ellinorae*. THIEL 1932*a*, p. 154. THIEL 1932*b*, pp. 445 ff.: distribution in Arctic. Kramp 1942, p. 77: Baffin Bay; distinct from *B. brucei*. Kramp 1947, p. 11, map Kramp 1959*a*, pp. 184, 253, 254, 262, 272, fig. 268; diagnosis; distribution. Mohr 1959: Arctic distribution.

Genus **Halicreas** Fewkes 1882

Halicreatidae with eight radial canals; with a continuous row of tentacles; with perradial gelatinous papillae on the exumbrella.

Type-species: *H. minimum* Fewkes.

Fewkes 1882*b*, p. 306: *Halicreas* n.g. Mayer 1910, p. 390: *Halicreas*, incl. *Haliscera* Vanhöffen.

Halicreas minimum Fewkes 1882

30–40 mm wide, thick, disk-like, with a small, conical apical projection of varying size; eight clusters of gelatinous papillae above margin; mouth a wide, circular opening. Eight broad, band-like radial canals and a broad ring canal; gonads flattened, extending along almost entire length of canals; tentacles very numerous, up to 640; 3–4 statocysts in each octant.

Fewkes 1882*b*, p. 306: *Halicreas minimum* n.g., n.sp.; off New England, east coast of U.S.A. Vanhöffen 1902, p. 68, Pl. 9, figs. 7, 8, Pl. 11, fig. 30: as *H. papillosum* n.sp.; tropical Atlantic and Indian oceans. Bigelow 1909*a*, p. 138, Pl. 3, fig. 3, Pl. 33, figs. 8, 9, Pl. 34, figs. 1–3, 5, 8, 10, 11: as *H. papillosum*; eastern tropical Pacific. Mayer 1910, p. 391, text-figs. 242, 243: as *H. papillosum*; (New England; tropical parts of Atlantic, Indian and eastern Pacific oceans; Malay Archipelago). Vanhöffen 1912, p. 378: as *H. papillosum*; in the deep of the tropical Atlantic. Bigelow 1913, p. 52: as *H. papillosum*; Bering Sea; S.E. coast of Kamchatka; Sea of Okhotsk; Suruga Gulf. Browne 1916*a*, p. 195: as *H. papillosum*; Farquhar Archipelago and Amirante Islands, north of Madagascar. Bigelow 1919, p. 324: as *H. papillosum*; Philippines. Kramp 1920*b*, p. 5: as *H. papillosum*; northern Atlantic. Foerster 1923, p. 266: as *H. papillosum*. Bigelow 1926, p. 67: as *H. papillosum*; Gulf of Maine, east coast of U.S.A. Uchida 1928*b*, p. 81: as *H. papillosum*; Japan. Broch 1929, p. 508, text-fig. 18: as *H. papillosum*; distribution. Thiel 1932*a*, p. 153: as *H. papillosum*. Thiel 1932*b*, pp. 445 ff.: as *H. papillosum*; distribution. Thiel 1935*b*: as *H. papillosum*, =*rotundatum* and *glabrum*; South Atlantic. Ranson 1936*b*, p. 164: as *H. papillosum*; description; Atlantic coast of Europe to Bay of Biscay in the north; Azores; S.W. of Nova Scotia. Thiel 1936*b*, p. 34, text-fig. 6: as *H. papillosum*, =*rotundatum* and *glabrum*; southern Atlantic. Bigelow 1938, p. 122: *H. minimum*; Bermudas, vertical distribution. Bigelow 1940, p. 302: eastern tropical Pacific. Kramp 1942, p. 70: Davis Strait. Kramp 1947, p. 7, Pl. 6, fig. 3, map: northern Atlantic. Uchida 1947*b*, p. 339: Japan. Kramp 1948*a*, p. 7: N.W. of South Georgia, Antarctic. Kramp 1948*b*, p. 4, map: central Atlantic. Fraser 1950, p. 93: as *H. rotundatum*; W. of Scotland. Vannucci 1951*b*, pp. 107, 112, 115, 117: Brazil. Kramp 1953, p. 299: Great Barrier Reef, Australia. Russell 1953, p. 452, text-figs. 299–300: W. of Ireland. Blackburn 1955, p. 419: S.E. Australian waters. Fraser 1955, pp. 9, 12: as *Halicreas* spp.; British Isles. Kramp 1955*a*, p. 271: W. Africa: off Liberia; off Angola; Gulf of Guinea. Naumov 1956*b*, p. 38. Kramp 1957*a*, pp. 46, 47, 100, 110 ff., 126: Atlantic; Antarctic area; east coast of Africa; pp. 46, 51: synonym: *H. papillosum*. Kramp

1957*b*, pp. 157, 162: Antarctic Sea. Petersen 1957, p. 44: N. Atlantic. Kramp 1958*b*, p. 368: west of Ceylon. Kramp 1959*a*, pp. 41, 181, 253–6, 260, 261, fig. 262: Atlantic; diagnosis; distribution.

Genus ***Haliscera*** Vanhöffen 1902

Halicreatidae with eight radial canals; with a continuous row of tentacles; without papillae on exumbrella.

Type-species: *H. conica* Vanhöffen.

Vanhöffen 1902, p. 68: *Haliscera* n.g. Mayer 1910, p. 390: *Halicreas*, incl. *Haliscera*. Ranson 1936*b*, pp. 168–71: discussion. Kramp 1947, pp. 6, 7, 10: discussion of species.

Haliscera alba Vanhöffen 1902

35 mm wide, almost hemispherical, evenly rounded; gonads lancet-shaped, along proximal 2/3 of radial canals; 8–12 tentacles and three statocysts in each octant. An obsolete species.

Vanhöffen 1902, p. 71, Pl. 9, fig. 5: *Haliscera alba* n.sp.; S.W. of Africa. Mayer 1910, p. 393, text-fig. 247: as *Halicreas alba*. Thiel 1935*b*: as *Haliscera album*, incl. *racovitzae* and *conica*. Thiel 1936*b*, p. 37, map: as *Halicreas album*. Bigelow 1938, p. 121: uncertain species. Kramp 1947, pp. 6, 7, 10. Kramp 1948*b*, p. 6. Kramp 1957*a*, p. 46: obsolete species.

Haliscera bigelowi Kramp 1947

15–17 mm wide, 9–10 mm high, almost hemispherical, with very thick hemispherical apex and thin jelly in marginal region; gonads broadly oval, about 2/5 of the length of radial canals, slightly nearer to stomach than to bell margin; about 12 tentacles and three statocysts in each octant; the thickenings of the nematocyst tissue around the bases of the tentacles are less pronounced than in *H. conica*.

Bigelow 1909*a*, p. 142, Pl. 3, figs. 1, 2, Pl. 33, figs. 6, 11, Pl. 34, fig. 9: as *Homoeonema alba*; eastern tropical Pacific. Mayer 1910, p. 393: as *Halicreas alba* in part. Kramp 1947, p. 8, Pl. 1, figs. 5–8, Pl. 2, figs. 1, 2, map: *Haliscera bigelowi* n.sp., ? = *Homoeonema alba* Bigelow 1909, non Vanhöffen; northern Atlantic. Kramp 1948*b*, p. 6: northern Atlantic. Russell 1953, p. 456, Pl. 24, fig. 2, text-figs. 301, 302. Kramp 1957*a*, p. 48. Petersen 1957, p. 41: ?*H. bigelowi*; northern Atlantic. Kramp 1959*a*, pp. 43, 182, 253, 254, 256, 259, 263, 272, fig. 264: off west coast of Africa; diagnosis; distribution.

Haliscera conica Vanhöffen 1902

Up to 18 mm wide, with a thick, bluntly conical apical projection; gonads oval, on middle portion of the eight broad radial canals; 8–9 tentacles and two statocysts in each octant, the base of each tentacle surrounded by a broad thickening of the marginal nematocyst tissue.

Vanhöffen 1902, p. 72, Pl. 9, fig. 6, Pl. 11, fig. 33: *Haliscera conica* n.g., n.sp.; Indian Ocean. Mayer 1910, p. 394, text-fig. 248: as *Halicreas conica*. Vanhöffen 1912, p. 381: Gauss Station, Antarctic. Kramp 1924, p. 29: as *Homoeonema conica*; Mediterranean. Broch 1929, p. 509, text-fig. 19: as *Halicreas* (*Haliscera*) *conica*. Ranson 1936*b*, p. 171: between Canary Islands and the Azores. Thiel 1936*b*, p. 37: as *Halicreas album*, incl. *racovitzae* and *conica*. Bigelow 1938, p. 121: as *Halicreas conicum*, incl. *racovitzae*; discussion. Kramp 1942, p. 76: uncertain species. Kramp 1947, p. 6. Kramp 1948*a*, p. 6: south of South Orkney Islands; N.W. of South Georgia. Blackburn 1955, p. 419: S.E. Australian waters. Kramp 1957*a*, pp. 46, 47, 48, 100, 110 ff., 126, text-fig. 17, map: variation; Cape of Good Hope; Gulf of Guinea; S.W. of Cape Verde Islands; Graham Land, Antarctic; from S. Georgia to southern point of S. America. Kramp 1957*b*, pp. 158, 162: Antarctic Sea. Kramp 1959*a*, pp. 182, 253, 255, 256, 261, 262, fig. 263: diagnosis; distribution.

Haliscera racovitzae (Maas 1906)

8 mm wide, 4 mm high, almost hemispherical, moderately thick jelly, flaccid, apex evenly rounded; stomach a truncated cone; gonads along proximal 1/2 to 2/5 of the radial canals, close to the stomach; six tentacles and two statocysts in each octant.

Maas 1906*b*, p. 10, Pl. 1, figs. 3, 4, Pl. 2, fig. 13: as *Homoeonema racovitzae* n.sp.; Bellingshausen Sea, Antarctic. Mayer 1910, p. 393, text-fig. 246: *Halicreas racovitzae*; Antarctic. non Vanhöffen 1912, p. 382, Pl. 2, fig. 4, text-fig. 17: South Atlantic off Cape Agulhas. Thiel 1931, p. 328: as *Halicreas racovitzae*; Weddell Sea. Thiel 1935*b*: as *Halicreas album*, incl. *racovitzae* and *conica*; southern Atlantic. Thiel 1936*b*, p. 37, map. Bigelow 1938, p. 121: =*Halicreas conicum*, discussion. Kramp 1947, p. 6: *Haliscera racovitzae*. Kramp 1957*a*, pp. 46, 47, 48, 49, 99, 126: E. of South Georgia. Kramp 1959*a*, pp. 183, 253, 261, 262, fig. 265: diagnosis; distribution.

Genus ***Halitrephes*** Bigelow 1909

Halicreatidae with several (16 or more) radial canals; with a continuous row of tentacles; without papillae on exumbrella.

Type-species: *H. maasi* Bigelow.

Bigelow 1909*a*, p. 145: *Halitrephes* n.g.

Halitrephes maasi Bigelow 1909

Up to about 100 mm wide, low, rounded, jelly fairly thin, soft and flaccid; stomach circular; 16–30 broad, ribbon-like radial canals, some of which may be bifurcated; shape of gonads unknown; 100–300 tentacles; number of statocysts unknown.

Bigelow 1909*a*, p. 146, Pl. 33, figs. 1–5, 7, 10, Pl. 45, fig. 13: *Halitrephes maasi* n.g., n.sp.; off coast of Peru. Mayer 1910, p. 394. Vanhöffen 1912, p. 384: as *H. valdiviae* n.sp.; tropical Atlantic and Indian oceans; southern Atlantic Ocean. Bigelow 1938, p. 125: as *H. valdiviae*; morphological remarks; Bermudas. Kramp 1947, p. 6: as *H. maasi* and *valdiviae*. Kramp 1948*a*, p. 7, text-fig. 1: as *H. medius* n.sp. and *valdiviae*; N.W. of South Georgia; p. 8: comparison between *H. maasi*, *valdiviae* and *medius*. BLACKBURN 1955, p. 420: as *H. valdiviae*; Tasmania. KRAMP 1957*a*, pp. 46, 51, 52, 100, 104, 126, text-fig. 19, map: variation; off S.W. Africa; east coast of Africa; S. of Australia; New Zealand; between New Zealand and S. America; p. 52: synonyms: *H. valdiviae* and *medius*. KRAMP 1958*b*, p. 368: S.W. of Ceylon. KRAMP 1959*a*, pp. 44, 183, 253, 256, 259, 260, 261, fig. 266: off west coast of Africa; West Indies; diagnosis; distribution.

Family *RHOPALONEMATIDAE*

Trachymedusae with narrow stomach with or without peduncle; with usually eight, rarely more, radial canals; without centripetal canals; with gonads on radial canals; with marginal tentacles evenly distributed, sometimes of two kinds, each tentacle of uniform structure throughout; with free, rarely enclosed, marginal sensory clubs.

Genus ***Aglantha*** Haeckel 1879

Rhopalonematidae with a long and slender gastric peduncle; with eight pendent, sausage-shaped gonads on the subumbrellar portions of the eight radial canals; with numerous tentacles all alike; with free, club-shaped marginal statocysts.

Type-species: *A. digitale* (O. F. Müller).

HAECKEL 1879, pp. 271, 276: *Aglantha* and *Agliscra* n.g. MAYER 1910, p. 401. BIGELOW 1913, p. 43: discussion of species.

Aglantha digitale (O. F. Müller 1776)

10–40 mm high, about half as wide as high, thimble-shaped, with a small conical apical projection, lateral walls thin, subumbrellar muscles strong; peduncle slender, almost as long as bell cavity; stomach small; mouth with four small, simple lips; gonads long, close to base of peduncle; 80 or more tentacles; eight statocysts; local varieties differ in size and colour.

O. F. MÜLLER 1776, p. 233: as *Medusa digitale* n.sp. PÉRON & LESUEUR 1809, p. 352: as *Melicerta digitale*. ESCHSCHOLTZ 1829, p. 95: as *Eirene digitale*. FORBES 1848, p. 34, Pl. 1, fig. 2: as *Circe rosea* n.sp. A. AGASSIZ 1865, p. 57, text-figs. 81–6: as *Trachynema digitale*. HAECKEL 1879, p. 272, Pl. 16, figs. 5, 6: *Aglantha digitalis* n.g. MAYER 1910, p. 402, Pl. 49, figs. 2, 2′: *A. digitale*; Atlantic north of 40° N.; northern Pacific. BIGELOW 1913, p. 43: discussion; N.W. Pacific. KRAMP 1913*a*, p. 269: *A. digitalis*; W. Greenland. KRAMP 1913*b*, p. 527: *A. digitalis*. LE DANOIS 1913*b*, p. 27, text-figs. 11–17: development; S.W. of Ireland; near Jan Mayen and between Jan Mayen and Iceland, Norwegian Sea. LE DANOIS 1913*c* pp. 352, 354: *A. digitalis*. LE DANOIS 1913*d*, p. 314: English Channel; Bay of Biscay; Faroes; Jan Mayen, Norwegian Sea. BIGELOW 1914*b*, p. 20: New England, east coast of U.S.A. KRAMP 1914, p. 428: *A. digitalis*; W. and E. Greenland. LE DANOIS 1914, p. 488: *A. digitalis*. BIGELOW 1915*b*, pp. 269, 314, 316: discussion of *A. rosea* and *digitale*; between Nova Scotia and Cape May, east coast of U.S.A. KRAMP 1915, pp. 8, 20: *A. digitalis*; Great Belt and Kattegat, Denmark. BIGELOW 1917, pp. 303–5: from Cape Cod to Halifax, east coast of U.S.A. BIGELOW 1918, p. 388: near Chesapeake Bay. BIGELOW 1920, pp. 10, 17: Alaska; Ungava, Labrador. KRAMP 1920*b*, p. 5: *A. digitalis*; northern Atlantic. SVERDRUP 1921, p. 26, Pl. 3, fig. 14: as *Aglaura hemistoma* var. '*laterna*'; p. 27, Pl. 4, fig. 16: *A. digitalis*; Kristianiafjord, Norway. BIGELOW 1922, p. 134: Gulf of Maine, east coast of U.S.A. LEBOUR 1922, p. 664: food. FOERSTER 1923, p. 265: Pacific coast of America; p. 266: as *A. digitale* var. *intermedia*; Pacific coast of Central and South America. JESPERSEN 1923, p. 109: *A. digitalis*; Bay of Disko to Cape York, W. Greenland. PEACOCK 1923, p. 95: Cullercoats, England. COY 1924, p. 56: as *A. digitale* var. *rosea*; Cullercoats. KRAMP 1924, p. 29, text-fig. 24: Bay of Biscay; S.W. of Ireland. PEACOCK 1924, p. 60: as *A. digitale* var. *rosea*; remarks; Cullercoats, England. KRAMP & DAMAS 1925, p. 318: Norway. RUSSELL 1925, p. 786: as *A. rosea*; Plymouth. UCHIDA 1925*b*, p. 97: Oshoro, northern Japan. BIGELOW 1926, pp. 38, 40, 48, 50, 352, map: Gulf of Maine, U.S.A. FISH 1926, p. 124: as *A. digitalis*; p. 125: as *A. conica*; Woods Hole, east coast of U.S.A. KRAMP 1927, p. 149, map: Denmark. RUSSELL 1927, p. 573: as *A. rosea*; Plymouth. UCHIDA 1927*b*, p. 225: Asamushi, Japan. UCHIDA 1928*b*, p. 79: as *A. digitalis*, belongs to family Trachynematidae, subfamily Aglaurinae; Japan. BROCH 1929, p. 512, text-figs. 22, 23: distribution. COWLES 1930, p. 331: Chesapeake Bay, east coast of U.S.A. SANDERSON 1930, p. 229: as *A. rosea*; Northumberland coast, England. UCHIDA 1930, p. 335: as *A. digitalis*; Misaki, Japan. WATSON 1930, p. 236: as *A. rosea*; Northumberland coast, England. MAR. BIOL. ASS. 1931, p. 83: as *A. rosea*; Plymouth. SAVAGE 1931, pp. 21, 30, 76: east coast of England. RUNNSTRÖM 1932, p. 31: as *A. digitale* var. *rosea* and *typica*; Norway. THIEL 1932*a*, p. 154. THIEL 1932*b*, pp. 445 ff.: distribution in Arctic. KRAMP 1933*b*, p. 16: E. Greenland. RUSSELL 1933, p. 76, tab. I: as *A. rosea*; Plymouth. UCHIDA 1933*a*, p. 132, text-fig. 8: S.W. of Kamchatka. BERNSTEIN 1934, pp. 9, 26: Kara Sea, north of Siberia. WULFF, BÜCHMANN & KÜNNE 1934, p. 334: as *A. digitalis*; North Sea. KÜNNE 1935, p. 65: as *A. digitalis*; Bay of Kiel, western part of Baltic Sea. RUSSELL 1935*a*, p. 27: biology. RUSSELL 1935*b*, pp. 314, 315, 318: as *A. rosea*; English Channel. HARDY 1936, p. 401: N. of Spitzbergen. RANSON 1936*b*, p. 177, Pl. 2, figs. 18–20: discussion of species and varieties; as *A. digitale* forma *typica*: Bay of Biscay; the Azores; Capo de Finisterre, N.W. Spain; between the Azores and America; as *A. digitale* forma *rosea*: off Capo de Finisterre; the Azores. FROST 1937, p. 26: as *A. digitalis*; Newfoundland. KRAMP 1937*b*, p. 130, text-fig. 59*a*, *b*: Denmark. KÜNNE 1937*a*, pp. 139, 147, 151–62: as *A. digitalis rosea*; North Sea. KÜNNE 1937*b*, p. 6: Baltic Sea. RUSSELL 1938*b*, pp. 413, 416, 417, 419, 433, 437: as *A. rosea*; Plymouth. UCHIDA 1938*b*, p. 43: Mutsu Bay, Japan. UCHIDA 1938*c*, p. 54: Onagawa Bay, Japan. BIGELOW & SEARS 1939, p. 362, map: from Cape Cod to Chesapeake Bay, east coast of U.S.A. KRAMP 1939*a*, p. 16: Iceland. RUSSELL 1939*a*, pp. 177, 179, 188: North Sea. YASHNOV 1939, pp. 112, 114: Kara Sea and Chukotski Sea, north of U.S.S.R. RUSSELL 1940*a*, p. 517: nematocysts. UCHIDA 1940*a*, p. 292: Akkeshi Bay, Japan. DUNBAR 1942, p. 74: eastern arctic Canada. KRAMP 1942, pp. 81–97: discussion of races; biology; W. Greenland. KRAMP 1943, p. 7: E. Greenland. KRAMP 1947, p. 27, map: literature since 1910; northern Atlantic. UCHIDA 1947*b*, p. 337: Japan. KRAMP 1948*b*, p. 12: northern Atlantic. YASHNOV 1948, p. 74, Pl. 21, fig. 4: Barents Sea to Chukotsky Sea; Bering Sea; Sea of Okhotsk. FRASER 1949*a*, p. 27: Scotland to Faroes. FRASER 1949*b*, p. 66: as *A. digitale* var. *rosea*; northern North Sea. FRASER & SAVILLE 1949*a*, p. 30: as

A. digitalis; Faroe Channel. FRASER & SAVILLE 1949*b*, p. 61: as *A. digitalis*; Scotland. FRASER 1950, p. 93: as *Aglantha*; northern North Sea. KÄNDLER 1950, p. 68: as *A. digitalis*; Fehmarnbelt, western Baltic Sea. VIBE 1950, p. 103: N.W. Greenland. DEEVEY 1952*b*, pp. 150, 151: Block Island Sound, Conn., U.S.A. FRASER 1952*b*, p. 104: as *Aglantha*; northern North Sea. KIELHORN 1952, p. 239: central Labrador Sea. KÜNNE 1952, pp. 4, 13, 22: as *A. digitalis rosea*; S.E. North Sea. YASHNOV 1952, p. 96: off Kamchatka. REES 1953*a*, p. 8: Herdlafjord, Norway. RUSSELL 1953, p. 447, Pl. 26, figs. 1–10, text-figs. 297, 298: as *A. digitale* var. *rosea*; round the British Isles. CHIU 1954*b*, p. 56. ? BERNHARD 1955*b*, p. 13: as *A. digitalis*; Morocco. KRAMP 1955*b*, p. 158. MACGINITIE 1955, pp. 42, 107, 119: breeding season; Point Barrow, Alaska. WIBORG 1955, p. 52, map: Norwegian Sea. BOGOROV 1956, p. 310: *A. digitalis*; Barents Sea. NAUMOV 1956*b*, p. 38. PETERSEN 1957, p. 42: N. Atlantic. UCHIDA 1958, p. 164: Sado, Japan. FRASER 1959, pp. 23, 30: Faroe-Shetland Channel; southern Iceland. GRAINGER 1959, pp. 471, 496: Iglooik, arctic Canada. KRAMP 1959*a*, pp. 56, 191, 242, 243, 246, 247, 250, 253, 254, 256, 262, fig. 289: east of the Azores; Bay of Biscay; diagnosis; distribution.

Aglantha elata (Haeckel 1879)

10–12 mm high, narrow, peduncle about half as long as bell cavity; stomach small; gonads issuing from about the middle of subumbrellar portions of radial canals; 40–48 tentacles; 16 statocysts.

HAECKEL 1879, pp. 276, 277, Pl. 16, fig. 2: as *Agliscra elata* and *Aglantha elongata*. MAAS 1893, p. 26: as *Agliscra elata*; W. Africa. MAYER 1910, p. 404, text-fig. 255: as *Aglantha elongata*; (Cape of Good Hope, South Africa; coast of Guinea, West Africa). BROCH 1929, p. 514, text-fig. 24: as *Aglantha elongata*; distribution. BLACKBURN 1955, p. 418: as *Aglantha elongata*, which is retained as a valid species; S.E. Australian waters. KRAMP 1955*a*, p. 306: doubtful if *Circe anais* Lesson 1843 and *C. elongata* Lesson 1843 from African waters – *Agliscra elata* Haeckel; p. 309: *Aglantha elata* = *Agliscra elata* Maas 1893 from W. Africa. KRAMP 1959*a*, pp. 191, 253, 256, 263, fig. 290: diagnosis; distribution.

Aglantha ignea Vanhöffen 1902

14 mm high, 7 mm wide; no peduncle, stomach half as long as bell cavity, four simple lips; gonads along middle half of the eight radial canals not pendent(!); eight large and 24 small tentacles; statocysts? Systematic position doubtful.

VANHÖFFEN 1902, p. 76, Pl. 9, fig. 10: as *Agliscra ignea* n.sp.; tropical Indian Ocean. MAYER 1910, p. 405, text-fig. 256: *Aglantha ignea*. RANSON 1932*b*, p. 16: doubtful if *A. ignea* belongs to Aglauridae. RANSON 1936*b*, p. 176: *A. ignea* does not belong to Aglauridae, but possibly to Trachynemidae.

Aglantha intermedia Bigelow 1909

15 mm high, 14 mm wide, with a small, conical apical projection; peduncle about half as long as bell cavity; stomach elongated; gonads long, sausage-

shaped, close to base of peduncle; the radial canals on the peduncle are not straight but S-shaped and arranged in four pairs; 80–90 tentacles.

BIGELOW 1909*a*, p. 122, Pl. 29, figs. 4–10: as *Aglantha digitale* var. *intermedia* nov. var.; eastern tropical Pacific. MAYER 1910, p. 404: as *A. digitale* var. *intermedia*.

Genus *Aglaura* Péron & Lesueur 1809

Rhopalonematidae with a slender gastric peduncle; with eight sausage-shaped gonads on the peduncle, not on the subumbrella; with numerous tentacles all alike; with free, club-shaped marginal statocysts.

Type-species: *A. hemistoma* Péron & Lesueur.

PÉRON & LESUEUR 1809, p. 351: *Aglaura* n.g. HAECKEL 1879, p. 274. MAYER 1910, p. 397. VANHÖFFEN 1913*b*, p. 26: discussion; synonyms: *Aglantha* and *Agliscra*. UCHIDA 1928*b*, p. 78: belongs to family Trachynematidae, subfamily Aglaurinae.

Aglaura hemistoma Péron & Lesueur 1809

4–6 mm high, 3–4 mm wide, with flat apex, jelly very thin; peduncle somewhat shorter than bell cavity; stomach small, mouth with four small, simple lips; gonads on the peduncle near stomach; 48–85 tentacles; eight statocysts.

PÉRON & LESUEUR 1809, p. 351: *Aglaura hemistoma* n.g., n.sp. HAECKEL 1879, p. 275, Pl. 16, figs. 3, 4. MAYER 1910, p. 398, Pl. 46, figs, 4, 5, Pl. 49, figs. 3–7, Pl. 50, fig. 11, text-figs. 250, 251: *A. hemistoma*, incl. *A. peronii* Leuckart 1856 and *A. ciliata* Perkins 1906; surface water in all warmer seas; p. 400, text-fig. 252: as *A. hemistoma* var. '*nausicaa*' Haeckel 1879; p. 400: as *A. hemistoma* var. '*prismatica*' Maas 1897; p. 400, text-fig. 253: as *A. hemistoma* var. '*laterna*' Maas 1893; p. 401: as *A. hemistoma* var. '*octagona*' Bigelow 1904; p. 404: as *Aglantha globuligera* Haeckel 1879. NEPPI 1912, p. 731: Adriatic Sea. VANHÖFFEN 1912, p. 374: Indian Ocean south to Réunion and Durban; Atlantic. VANHÖFFEN 1913*a*, p. 427: *A. hemistoma*; p. 428: as *A. elongata*; Tortugas, Florida. VANHÖFFEN 1913*b*, p. 28: *A. hemistoma*; between Panama and Galapagos Islands; Hong Kong, China; p. 28: as *A. elongata*; off Peru. BIGELOW 1913, p. 42: Japan. NEPPI & STIASNY 1913*b*, p. 80: Trieste, Adriatic Sea. BIGELOW 1914*b*, p. 20: Gulf Stream, New England. BIGELOW 1915*b*, p. 316: off Delaware Bay, east coast of U.S.A. MAYER 1915*a*, p. 160: Torres Strait, Australia. BROWNE 1916*a*, p. 196: =*A. prismatica* Maas 1897 and *A. octagona* Bigelow 1904; Indian Ocean: north of Chagos Archipelago, off Mauritius, N. of Saya de Malha Bank, Farquhar Islands, Alphonse Islands and Amirante Islands. BIGELOW 1917, p. 306: off Georges Bank, east coast of U.S.A. BIGELOW 1918, p. 387: between Chesapeake Bay and Bermudas. PELL 1918, pp. 22, 30: Adriatic Sea. BIGELOW 1922, p. 157: off Chesapeake Bay, east coast of U.S.A. ANSELMI 1923, p. 69: as *Aglaura*; Mediterranean. FOERSTER 1923, p. 265. RANSON 1925*b*, p. 382: Tunis. BIGELOW 1926, p. 54: Gulf of Maine, east coast of U.S.A. UCHIDA 1928*b*, p. 78, text-fig. 2: Japan. BROCH 1929, p. 511, text-fig. 21: *A. hemistoma*; p. 514, text-fig. 24: distribution. CANDEIAS 1930, p. 49: Portugal. CANDEIAS 1932, p. 6: Portugal. RANSON 1932*b*, pp. 14, 16: *Aglantha globuligera* belongs to *Aglaura*. LELE & GAE 1935, p. 95: Bombay, India. RUSSELL 1935*b*, p. 315. THIEL 1935*b*: southern Atlantic. DAWYDOFF 1936, p. 469: as *Aglaura*; Indochina. RANSON 1936*b*, p. 184: synonyms: *A. prismatica* Maas and *octagona* Bigelow; *Aglantha* *globuligera* belongs to *Aglaura*; many localities. Thiel 1936*b*, p. 39, map: = *A. elongata* Vanhöffen 1913*a*, *b* and Broch 1929; Atlantic. Pell 1938, p. 927: Adriatic Sea. Uchida 1940*a*, p. 292: Japan. Uchida 1947*a*, p. 313: Palao Islands, central Pacific. Uchida 1947*b*, p. 337: Japan. Babnik 1948, pp. 43, 70: remarks; Adriatic Sea. Moore 1949, pp. 8, 91: Bermudas; 'Gulf Stream'. Ranson 1949, p. 130: Senegal, W. Africa. Berrill 1950, p. 295, text-fig. 1, i-n: development. Nair 1951, p. 69: Trivandrum coast, India. Vannucci 1951*b*, pp. 113, 114, 117: Brazil. Bal & Pradhan 1952, p. 76: Bombay, India. Kramp 1953, p. 300: N.E. Australia. Chiu 1954*b*, pp. 51, 52, 55: China. Blackburn 1955, p. 417: S.E. Australian waters. Hure 1955, p. 7: Adriatic Sea. Kramp 1955*a*, p. 274: Canary Islands; Gulf of Guinea; off Angola, W. Africa; pp. 308, 309: =*Aglantha globulifera* and *Aglaura laterna* Haeckel from Canary Islands. Kramp 1956*a*, p. 4: from coast of Colombia, S. America, to Marquesas Islands. Kramp 1957*a*, pp. 62, 125: from Cape Verde Islands to Cape of Good Hope. Vannucci 1957*d*, pp. 76, 93, 96, 97, 99, 102, figs. 20, 21 (map and diagram); Brazil. Kramp 1958*a*, p. 125: Villefranche, Mediterranean. Ganapati & Nagabhushanam 1958, p. 93: Vizagapatam coast, India. Yamazi 1958, p. 137: Tanabe Bay, Japan. Kramp 1959*a*, pp. 57, 192, 242, 243, 246, 249, fig. 291: off west coast of Africa; West Indies; diagnosis; distribution.

Genus ***Amphogona*** Browne 1905

Rhopalonematidae with a short, conical gastric peduncle; exumbrella smooth; with ellipsoidal or sac-shaped, pendent gonads on the eight radial canals; gonads usually of unequal size; with tentacles all alike not densely crowded; with free, club-shaped marginal statocysts.

Type-species: *A. apsteini* (Vanhöffen).

Browne 1905*a*, pp. 724, 739: *Amphogona* n.g. Mayer 1910, p. 405.

Amphogona apicata Kramp 1957

Up to 7 mm wide and 8 mm high, with thin walls and a bluntly conical apical projection; stomach small, tubular; four short simple lips; gonads sac-shaped, pendent, near middle points of radial canals; about 64 tentacles; statocysts unknown.

Kramp 1957*a*, p. 59, Pl. 5, fig. 7: *Amphogona apicata* n.sp.; southern Atlantic; Mozambique Channel. Kramp 1959*a*, pp. 54, 188, 253, 256, 259, 261, 263, fig. 281: Canary Islands; off S.W. Africa; diagnosis; distribution.

Amphogona apsteini (Vanhöffen 1902)

4–6 mm wide, lower than a hemisphere, with thin jelly; stomach small; four short simple lips; gonads ellipsoidal, near ring canal, of unequal size, occasionally four males and four females in the same individual; 50–70 tentacles; 16–24 statocysts.

Vanhöffen 1902, p. 65, Pl. 10, fig. 18, Pl. 11, fig. 28: as *Pantachogon apsteini* n.sp.; Sumatra. Browne 1905*a*, p. 740, Pl. 54, fig. 5, Pl. 56, fig. 1, Pl. 57, figs. 10–15: *Amphogona apsteini* n.g.; Maldive Islands, Indian Ocean. Mayer 1910, p. 405, text-fig. 257: (Pacific coast of Mexico). Browne 1916*a*, p. 197: N. of Chagos Archipelago, Cargados Carajos and Farquhar Islands, all localities in the Indian Ocean. Browne 1916*b*, p. 152: Okhamandal, N.W. India. Foerster 1923, p. 266: reference to Bigelow 1909. Uchida 1928*b*, p. 79: belongs to family Trachynematidae, subfamily Aglaurinae; Japan. Uchida 1947*a*, p. 313: Palao Islands, central Pacific Ocean. Kramp 1953, p. 300: N.E. Australia. Kramp 1955*a*, p. 274: Gulf of Guinea. Kramp 1956*a*, pp. 3, 4: N. of the Galapagos Islands. Kramp 1957*a*, p. 60. Kramp 1959*a*, pp. 188, 242, 249, 250, 251, fig. 280; diagnosis; distribution.

Amphogona pusilla Hartlaub 1909

1·5 mm wide, nearly hemispherical, with thin jelly; stomach small; four simple lips; gonads spherical on the radial canals, leaving 1/4 of the length of radial canal near ring canal free; 16 tentacles; statocysts unknown.

Hartlaub 1909*b*, p. 462, Pl. 21, fig. 27: *Amphogona pusilla* n.sp.; Djibuti, East Africa. Mayer 1910, p. 497. Kramp 1957*a*, p. 60.

Genus ***Arctapodema*** Dall 1907

Rhopalonematidae without a gastric peduncle; with gonads on radial canals adjacent to stomach; with eight narrow radial canals; with numerous tentacles, all alike, in a single row; with free club-shaped marginal statocysts.

Type-species: *A. ampla* (Vanhöffen).

Vanhöffen 1902, p. 65: as *Homoeonema*. Maas 1906*b*, p. 5: as *Isonema* n.g. Dall 1907, p. 660: *Arctapodema* nom. nov.; *Isonema* preoccupied for a mollusc. Mayer 1910, p. 387: as *Homoeonema* in part. Ranson 1936*b*, p. 156: discussion. Kramp 1957*a*, p. 55: revision of species.

Arctapodema ampla (Vanhöffen 1902)

Up to 15 mm wide, somewhat flatter than a hemisphere, thin jelly, thicker at apex; stomach short, urn-shaped, with eight radial lobes; four simple lips; eight swollen gonads adjacent to the gastral lobes; the gonads may be of unequal size, and some of them may be radially divided into two halves; small additional gonads may also appear in pairs on the radial canals at a short distance from the gastral lobes; about 100 tentacles; 4–8 marginal statocysts.

Vanhöffen 1902, p. 65, Pl. 10, fig. 21, Pl. 11, figs. 24, 26, 27: as *Homoeonema amplum* n.sp.; South Atlantic. Maas 1906*b*, p. 5, Pl. 1, figs. 1, 2, 7, Pl. 2, figs. 8, 12, Pl. 3, figs. 14, 20: as *Isonema amplum* n.g.; Antarctic waters. Dall 1907, p. 660: *Arctapodema amplum*. Mayer 1910, p. 387, text-figs. 236, 237: as *H. amplum*. Vanhöffen 1912, p. 374, text-figs. 4–7: as *I. amplum*; Gauss Station, Antarctic. Bigelow 1913, p. 44: belongs to *Pantachogon*. Thiel 1931, p. 324: as *H. amplum*; Weddell Sea, Antarctic. Thiel 1935*b*, p. 37: =*H. platygonon* Browne 1903, non Maas 1893. Ranson 1936*b*, pp. 156, 157, Pl. 2, fig. 17: description and discussion;

off Algiers, N. Africa. THIEL 1936*b*, p. 26: =*H. platygonon* Browne 1903, non Maas 1893. PELL 1938, p. 926: as *Isonema najadis* n.sp.; Adriatic Sea. KRAMP 1955*a*, p. 273: off Liberia, W. Africa. KRAMP 1957*a*, pp. 55, 56, 99, 126, Pl. 5, fig. 4, text-fig. 9, map: *A. tetragonium* (Vanh. 1912) probably = *A. amplum*; N. and S. Georgia; Graham Land, Antarctic: p. 55: *A. najadis* = *A. amplum.* KRAMP 1959*a*, pp. 188, 253, 255, 256, 261, 262, fig. 279: diagnosis; distribution.

Arctapodema antarctica (Vanhöffen 1912)

Up to 16 mm wide, hemispherical, fairly thin jelly; stomach tubular; four interradial gonads encircling base of stomach but interrupted in the four perradial corners; no gonads on the radial canals; about 120 tentacles; statocysts unknown; stomach red in adult.

VANHÖFFEN 1912, p. 375, text-figs. 8, 9: as *Isonema antarcticum* n.sp.; Gauss Station, Antarctic. RANSON 1936*b*, p. 157: *Arctapodema antarcticum*; is temporarily retained. THIEL 1936*b*, p. 26: =*Homoeonema platygonon* Browne. KRAMP 1957*a*, pp. 55, 56, 58, 99, 100, 126, text-fig. 9, map: Antarctic; between S. Africa and Australia; W. of South Sandwich Islands; near Shag Rocks, S.W. Atlantic. KRAMP 1959*a*, pp. 187, 253, 261, 262, fig. 277: diagnosis; distribution.

Arctapodema australis (Vanhöffen 1912)

Up to 23 mm wide and 14 mm high, thin jelly; stomach short and broad, with 16 radial folds; four lips; eight gonads globular or club-shaped, pendent, on the radial canals near base of stomach; about 112 tentacles; statocysts unknown; stomach violet, canals and tentacles wine-red, gonads yellow.

VANHÖFFEN 1912, p. 376, text-figs. 10, 11: as *Isonema australe* n.sp.; Gauss Station. RANSON 1936*b*, p. 157: *Arctapodema australe*; is temporarily retained. THIEL 1936*b*, p. 26: =*Homoeonema platygonon* Browne. KRAMP 1957*a*, pp. 55, 56, 58, 99, 100, 126, Pl. 5, figs. 5, 6, text-fig. 9, map: between S. Africa and Australia. KRAMP 1959*a*, p. 187, fig. 278: diagnosis; distribution.

Arctapodema macrogaster (Vanhöffen 1902)

7 mm wide; stomach fairly large, four lips; eight spherical gonads adjacent to stomach; 84 tentacles; 32 statocysts. Possibly = *A. australis.*

VANHÖFFEN 1902, p. 66, Pl. 10, fig. 22: as *Homoeonema macrogaster* n.sp.; southern Indian Ocean. MAYER 1910, p. 388, text-fig. 238: as *H. macrogaster.* BIGELOW 1913, p. 44: belongs to *Pantachogon.* THIEL 1935*b*, p. 37: =*H. platygonon* Browne. RANSON 1936*b*, p. 157: *Arctapodema macrogaster*, temporarily retained. THIEL 1936*b*, p. 26: =*H. platygonon.* KRAMP 1957*a*, p. 55.

Arctapodema tetragonia (Vanhöffen 1912)

12 mm wide; stomach short, four short lips; four gonads, kidney-shaped, on walls of stomach adjacent to subumbrella; about 112 tentacles; statocysts? Probably = *A. ampla.*

VANHÖFFEN 1912, p. 377, text-figs. 12–15: as *Isonema tetragonium* n.sp.; equatorial Atlantic. RANSON 1936*b*, p. 157: *Arctapodema tetragonium*, temporarily retained. THIEL 1936*b*, p. 26: *Homoeonema platygonon* Browne. KRAMP 1957*a*, pp. 55, 56, 58: probably identical with *A. amplum.*

Genus *Colobonema* Vanhöffen 1902 *

Rhopalonematidae without a gastric peduncle; with the apical outlines of the subumbrellar muscular fields forming a star-shaped figure; with elongated gonads extending along the eight radial canals; with tentacles all of one kind, developing in succession; with free, club-shaped marginal statocysts.

Type-species: *C. sericeum* Vanhöffen.

VANHÖFFEN 1902, p. 56: *Colobonema* n.g. MAYER 1910, p. 383: as *Homoeonema* in part. KRAMP 1947, p. 18: diagnosis of the genus.

Colobonema sericeum Vanhöffen 1902

Up to 45 mm wide and 35 mm high; bell-shaped, slightly conical, with fairly thin jelly and without an apical projection; stomach more or less elongated, tubular; four small lips; gonads linear, straight, extending along greater part of radial canals; 32 tentacles, the adradial tentacles developed before the interradial; statocysts probably alternating with the tentacles; velum broad.

VANHÖFFEN 1902, p. 57, Pl. 9, fig. 1, Pl. 12, figs. 39–42: *Colobonema sericeum* n.g., n.sp.; W. coast of Africa. MAAS 1905, p. 53, Pl. 10, figs. 62–5: as *C. typicum.* MAYER 1910, p. 385, text-fig. 231: as *Homoeonema typicum* Maas 1897 in part. VANHÖFFEN 1912, p. 372: *C. sericeum,* non =*H. typicum*; southern Atlantic; central Atlantic; N.W. of Cape Verde Islands. KRAMP 1920*b*, p. 5: northern Atlantic. KRAMP 1924, p. 28: comparison with *C. typicum*; S.W. of Ireland. BROCH 1929, p. 500, text-fig. 12: as *Homoeonema* (*Colobonema*) *sericeum*; (Atlantic and Pacific, intermediate water). RANSON 1936*b*, p. 152, Pl. 2, figs. 14, 15: discussion; temperate Atlantic. BIGELOW 1938, p. 117: as *C. typicum.* BIGELOW 1940, p. 302: as *C. typicum*; Panama. KRAMP 1947, p. 18, map: northern Atlantic. UCHIDA 1947*b*, p. 337: as *C. typicum*; Japan. KRAMP 1948*b*, p. 9, map: northern Atlantic. RUSSELL 1953, pp. 436, 440, Pl. 25, fig. 1, text-figs. 287–9: *C. typicum* Maas 1905 =*C. sericeum*; W. of Ireland. BLACKBURN 1955, p. 416: S.E. Australian waters. KRAMP 1955*a*, p. 273: off Angola; off Liberia, W. Africa. KRAMP 1957*a*, pp. 54, 100, 104, 110 ff., 126, text-fig. 19, map: between Africa and S. America; from South Africa to Australia; Mozambique Channel. PETERSEN 1957, p. 44: N. Atlantic. NICOL 1958, p. 716: Bay of Biscay. KRAMP 1958*b*, pp. 159, 162: Indian Ocean. KRAMP 1959*a*, pp. 52, 186, 253, 256, 259. fig. 275: Bay of Biscay; Atlantic Ocean; Gulf of Panama; diagnosis; distribution.

Colobonema typicum (Maas 1897, non 1905)

20 mm wide, 12 mm high, jelly thin, but rigid; stomach short, urn-shaped, four small lips; gonads along distal half of radial canals; about 40 tentacles; statocysts? (The description incomplete, partly based on a figure.)

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* For an additional species, see Addenda, p. 445.

MAAS 1897, p. 22, Pl. 3, figs. 1–3: as *Homoeonema typicum* n.sp.; Pacific coast of Central America. MAYER 1910, p. 385: as *H. typicum* in part. BIGELOW 1913, p. 46: *Colobonema typicum*; Japan. BIGELOW 1919, p. 322: Philippines. FOERSTER 1923, p. 265. KRAMP 1924, p. 28: different from *C. sericeum*. UCHIDA 1928*b*, p. 81: as *H. typicum*, belongs to subfamily Halicreasinae; report of Bigelow 1913. BIGELOW 1938, p. 117: *C. typicum* = *sericeum*, morphological remarks; Bermudas. BIGELOW 1940, p. 302: Pacific coast of Panama. KRAMP 1947, p. 19: *C. typicum* Maas 1897 (non 1905) different from *C. sericeum*. RUSSELL 1953, pp. 436, 440: *C. typicum* Maas 1905 = *C. sericeum*, *C. typicum* Maas 1897 non = *sericeum* and is retained as a doubtful species.

Genus ***Crossota*** Vanhöffen 1902

Rhopalonematidae with or without a short gastric peduncle; with numerous meridional furrows on the exumbrella; with eight or more radial canals; with pendent, sausage-shaped gonads on the radial canals; with numerous densely crowded tentacles all alike; with free, club-shaped marginal statocysts.

Type-species: *C. brunnea* Vanhöffen.

VANHÖFFEN 1902, p. 72: *Crossota* n.g. MAYER 1910, p. 395. BIGELOW 1913, p. 47: discussion. UCHIDA 1928*b*, p. 80: belongs to Aglaurinae. BROCH 1929, p. 505: key for determination of the species: *C. brunnea, norvegica, alba, pedunculata* and *rufobrunnea*. RANSON 1936*b*, p. 160: discussion. THIEL 1936*b*, pp. 20 ff.: discussion. BIGELOW 1938, p. 118: discussion. KRAMP 1947, p. 21: discussion; morphological remarks. KRAMP 1959*a*, p. 273: geographical speciation.

Crossota alba Bigelow 1913

Up to 42 mm wide and 28 mm high; no peduncle; stomach tubular, narrow, with eight sharp longitudinal ridges separated by eight broad, flat furrows; four small lips; gonads on the eight radial canals somewhat nearer to ring canal than to stomach; up to 190 tentacles; number of statocysts unknown; stomach dark chocolate-brown, almost black, oral lips white, umbrella colourless.

BIGELOW 1913, p. 149, Pl. 3, figs. 9–12: *Crossota alba* n.sp.; northern Japan. UCHIDA 1928*b*, p. 80: belongs to subfamily Aglaurinae; report of Bigelow. THIEL 1936*b*, p. 20: synonym of *C. brunnea*. KRAMP 1947, p. 22: *C. alba* a valid species. UCHIDA 1947*b*, p. 339: *C. alba*?; Japan. NAUMOV 1956*b*, pp. 38, 40. KRAMP 1957*a*, pp. 61, 99, 105, 126: tropical Atlantic. NICOL 1958, p. 715: Bay of Biscay. KRAMP 1959*a*, pp. 56, 191, 252, 256, 263, 273, fig. 288: Bay of Biscay; off west coast of Africa; diagnosis; distribution.

Crossota brunnea Vanhöffen 1902

Up to about 30 mm wide and 22 mm high; without a gastric peduncle; stomach bottle-shaped, short, with eight large, deep longitudinal fissures and above them eight similar small invaginations; mouth with four small lips; eight radial canals; gonads on the radial canals near base of stomach; 600 or more tentacles very densely crowded; number of statocysts unknown. Colour of umbrella brown.

Vanhöffen 1902, p. 73, Pl. 9, figs. 11–13, Pl. 12, figs. 34–8, 43–7: *Crossota brunnea* n.g., n.sp.; Atlantic, Pacific and Indian oceans. Bigelow 1909*a*, p. 135, Pl. 2, fig. 7, Pl. 45, fig. 9: eastern Pacific south of Equator. Mayer 1910, p. 396, text-fig. 249. Vanhöffen 1912, p. 385: N.W. of Gauss Station, Antarctic. Thiel 1932*b*, p. 477. Thiel 1936*b*, p. 20, map: synonyms: *C. alba* Bigelow 1913 and Uchida 1928, *C. brunnea* var. *norvegica* Bigelow 1913 and *C. norvegica* Kramp 1920, Thiel 1932, Broch 1929 (non Vanhöffen 1902); southern Atlantic. Kramp 1947, p. 21. Uchida 1947*b*, p. 338: Japan (first record north of Equator). Kramp 1948*a*, p. 10: N.W. of South Georgia, southern Atlantic. Vannucci 1951*b*, p. 106: Brazil. Kramp 1957*a*, pp. 61, 62, 100, 110 ff., 126, text-fig. 17 (map): antarctic sections of all oceans; S. Atlantic; E. Indian Ocean. Kramp 1958*b*, pp. 159, 162: Indian Ocean and Antarctic Sea. Kramp 1959*a*, pp. 55, 190, 253, 256, 259, 261, 263, 273, fig. 285: off Sierra Leone, W. Africa; diagnosis; distribution.

Crossota norvegica Vanhöffen 1902

20 mm wide, 18 mm high; without a gastric peduncle; stomach bottle-shaped, with irregular longitudinal ridges and invaginations; 5–7 upturned lips; 10–14 radial canals; gonads on the radial canals near base of stomach; about 275 tentacles; statocysts unknown; colour of umbrella a deep reddish-brown.

Vanhöffen 1902, p. 75: *Crossota norvegica* n.sp.; off coast of Norway. Mayer 1910, p. 396: *C.* ‘ *norvegica* ’; probably identical with *C. brunnea*. Kramp & Damas 1925, p. 317: new description; criticism of Vanhöffen; Norwegian Sea (Vanhöffen's original specimens). Broch 1929, p. 507: *C. norvegica*, incl. *C. brunnea* var. *norvegica* Bigelow 1913 and *C. norvegica* Kramp 1920. Thiel 1932*a*, p. 153: incl. *C. brunnea* var. *norvegica* Bigelow 1913. Thiel 1932*b*, pp. 444 ff., in part: distribution. Thiel 1936*b*, p. 22: does not belong to *Crossota*. Kramp 1947, pp. 22, 26, Pl. 4, figs. 5, 6: Norwegian Sea; N.E. of Iceland. Kramp 1959*a*, pp. 191, 253, 254, 261, 263, 273, fig. 287: diagnosis; distribution.

Crossota pedunculata Bigelow 1913

25 mm wide; stomach flask-shaped, on a short cylindrical peduncle; eight radial canals; gonads during growth gradually displaced from 1/3 to 2/3 meridional distance from base of stomach; up to 640 or more tentacles; statocysts unknown; colour of umbrella reddish-brown.

Bigelow 1913, p. 51, Pl. 3, fig. 13: *C. pedunculata* n.sp.; near mouth of Columbia River, Pacific coast of U.S.A. Foerster 1923, p. 265. Thiel 1936*b*, p. 22: probably belongs to *Aglantha*. Kramp 1947, p. 22: *C. pedunculata* a valid species. Kramp 1959*a*, pp. 263, 273.

Crossota rufobrunnea (Kramp 1913)

Up to 15 mm wide and 10 mm high; without a gastric peduncle; stomach bottle-shaped, short, with eight large, deep longitudinal fissures and above them eight similar small invaginations; mouth with four small, out-turned lips; eight radial canals; gonads on the radial canals near base of stomach; about 200–250 tentacles; number of statocysts unknown; umbrella, stomach and tentacles deep reddish-brown.

Bigelow 1913, p. 48: as *C. brunnea* var. *norvegica*; N.W. Pacific. Kramp 1913*a*, p. 273, text-figs. 1, 2: as *Aglantha rufobrunnea* n.sp.; Davis Strait. Kramp 1914, p. 433: as *A. rufobrunnea*; Davis Strait. Kramp 1920*b*, p. 5: as *C. norvegica*; northern Atlantic. Kramp & Damas 1925, p. 317: *Crossota rufobrunnea*. Broch 1929, p. 506; text-fig. 17. Thiel 1932*a*, p. 153. Thiel 1932*b*, pp. 444 ff.: distribution. Ranson 1936*b*, p. 162: Bay of Biscay. Thiel 1936*b*, p. 22: does not belong to *Crossota*. ?Bigelow 1938, p. 119: ?*C. brunnea*; morphological remarks; Bermudas. Kramp 1942, p. 79: to *Crossota*; Davis Strait. Kramp 1947, p. 22, Pl. 2, figs. 9, 10, Pl. 3, figs. 1–8, Pl. 4, figs. 1–4, Pl. 6, fig. 5, text-figs. 9*a–e*, 10*a*, *b*, map: morphology; northern Atlantic. Uchida 1947*b*, p. 338: Japan. Kramp 1948*b*, p. 12: northern Atlantic from S. of Azores to W. of Scotland, map. Yashnov 1952, p. 95: off Kamchatka. Russell 1953, p. 444, text-figs. 293–6. Chiu 1954*b*, p. 56: as *C. norvegica*. Zenkewitch 1954, p. 72: Kurile-Kamchatka trench, 500–2,000 metres. Naumov 1956*b*, p. 38: as *C. brunnea*; Okhotian Sea; Bering Sea. Petersen 1957, p. 44: N. Atlantic. Kramp 1959*a*, pp. 190, 253, 254, 256, 259, 263, 273, fig. 286: diagnosis; distribution.

Genus ***Homoeonema*** (Maas 1893) Browne 1903

Rhopalonematidae without a gastric peduncle; with gonads forming a continuous band around the base of the stomach extending outwards along the eight radial canals; with numerous tentacles all alike; with vesicular marginal statocysts.

Type-species: *H. platygonon* Browne.

Maas 1893, p. 15: *Homoeonema* n.g.; insufficient description. Browne 1903, p. 21: adequate description of both genus and species. Mayer 1910, p. 383: as *Homoeonema* and *Colobonema*. Kramp 1947, pp. 14–17: revision, *H. platygonon* the only species

Homoeonema platygonon Browne 1903

1–2 mm wide and high; gonads extending from stomach outwards along proximal half of radial canals; about 80 or more tentacles; four statocysts.

? Maas 1893, p. 15, Pl. 1, fig. 8: *Homoeonema platygonon* n.g., n.sp.; between Iceland and Greenland. Browne 1903, p. 21, Pl. 2, figs. 2, 3: new description; coast of Norway. Mayer 1910, p. 386, text-figs. 232–4. ?Grobben 1915, p. 4: Adriatic Sea. ?Neppi 1915, p. 4: Adriatic Sea. ?Pell 1918, pp. 22, 28, text-fig. 3: Adriatic Sea. ?Neppi 1920*b*, p. 91: abnormal specimen; Naples, Italy. Kramp & Damas 1925, p. 318: Norway. Broch 1929, p. 502, text-fig. 14: between Scotland and southern point of Greenland; Norwegian fjords. Runnström 1932, p. 30: biological remarks; Herdla- and Hjeltefjord, Norway. Thiel 1932*a*, p. 152. Thiel 1932*b*, p. 444 ff.: distribution. Bernstein 1934, pp. 26, 53: Kara Sea. Kramp 1937*b*, p. 132, text-fig. 59*c*. Bigelow 1938, p. 120: discussion. ?Pell 1938, p. 927: Adriatic Sea. Yashnov 1939, p. 112: Kara Sea. Kramp 1947, p. 17, Pl. 2, fig. 6: discussion, *H. platygonon* the only species; Herløfjord, Norway. Yashnov 1948, p. 73, Pl. 21, fig. 2: Kara Sea. ?Vannucci 1951*b*, pp. 112, 114, 115, 117: as *H. platygonon* sens. Browne; Brazil. Kramp 1957*a*, pp. 55, 56. Kramp 1959*a*, pp. 185, 242, 243, fig. 269: diagnosis; distribution.

Genus ***Pantachogon*** Maas 1893

Rhopalonematidae without a gastric peduncle; with the apical outlines of the subumbrellar muscular fields forming an entire circle; with gonads along the eight radial canals separated from stomach; with 48 or more tentacles all alike; with free, club-shaped marginal statocysts.

Type-species: *P. haeckeli* Maas.

Maas 1893, p. 17: *Pantachogon* n.g. Mayer 1910, pp. 387, 388: as *Homoeonema* in part and *Pantachogon.* Bigelow 1913, p. 44: discussion of species; as *Pantachogon, Isonema* and *Homoeonema* in part. Thiel 1936*b*, p. 24: only two species: *P. rubrum* and *platygonon.*

Pantachogon haeckeli Maas 1893

About 12 mm high and wide, bell-shaped, with thin jelly and without an apical projection; with very strong and conspicuous musculature; stomach short; four small, simple lips; gonads extending along greater portion of the eight radial canals; 64 tentacles all alike; 64 club-shaped statocysts; velum very broad.

Maas 1893, p. 17, Pl. 1, fig. 2: *Pantachogonon hackelii* n.g., n.sp.; S.W. of Iceland. Vanhöffen 1902, p. 63, Pl. 9, fig. 9, Pl. 10, figs. 19, 20, Pl. 11, fig. 25: as *P. rubrum* n.sp.; tropical Atlantic, Indian and Pacific oceans. Mayer 1910, p. 389, text-fig. 239: *P. haeckelii*; p. 389, text-figs. 240, 241: as *P. rubrum,* possibly -*P. haeckelii.* Bigelow 1913, p. 44: N.W. Pacific. Kramp 1913*a*, p. 274: as *P. rubrum*; W. Greenland. Kramp 1914, p. 433: as *P. rubrum*; W. Greenland. Browne 1916*a*, p. 195: as *P. rubrum*; Chagos Archipelago; between Providence Islands and Alphonse Islands., Indian Ocean. Kramp 1920*b*, p. 5: as *P. rubrum*; northern Atlantic. Foerster 1923, p. 265: report of Bigelow. Kramp 1924, p. 22: as *P. rubrum*; Bay of Biscay; S.W. of Ireland. Broch 1929, p. 503, text-fig. 15: as *P. haeckeli*; p. 504, text-fig. 16: as *P. rubrum*; distribution. ?Thiel 1931, p. 330: as *P. rubrum*; Weddell Sea (probably *P. scotti*). Thiel 1932*a*, p. 152: as *P. haeckeli* and *rubrum.* Thiel 1932*b*, pp. 444 ff.: as *P. haeckeli* and *rubrum*; distribution. Ranson 1936*b*, p. 147, Pl. 2, fig. 16: as *P. rubrum*; discussion; Bay of Biscay; Straits of Gibraltar; waters between Azores, Canary Islands and Madeira; between the Azores and America. Thiel 1936*b*, p. 24, map: as *P. rubrum,* -*P. haeckeli, P. scotti* in part, *Homoeonema typicum* and *militare, Colobononema sericeum*; southern Atlantic. Bigelow 1938, p. 115: *P. haeckeli* -*rubrum*; discussion; morphological remarks; Bermudas. Kramp 1942, p. 78: *P. haeckeli*–*rubrum*; Davis Strait; Baffin Bay. Kramp 1947, p. 19, Pl. 2, figs. 7, 8, map: northern Atlantic. Uchida 1947*b*, p. 336: Japan. Kramp 1948*a*, p. 9: N. and N.W. of South Georgia, Antarctic. Kramp 1948*b*, p. 9: northern Atlantic. Yashnov 1948, p. 73, Pl. 21, fig. 3: Bering Sea; Sea of Okhotsk. Fraser 1950, pp. 94, 95: as *P. rubrum*; N.W. of Scotland. Yashnov 1952, p. 95: off Kamchatka. Russell 1953, p. 440, Pl. 25, fig. 2, text-figs. 290–2: W. of Ireland. Chiu 1954*b*, p. 56. Blackburn 1955, p. 416: S.E. Australian waters. Fraser 1955, pp. 9, 12: British Isles, as *P. rubrum.* Kramp 1955*a*, p. 273: off Senegal, Liberia; Gulf of Guinea. Kramp 1957*a*, pp. 53, 92, 100, 110 ff., 126, text-fig. 18, map: with larvae of Narcomedusae; W. and E. African waters south of Cape Verde Islands and Somaliland; southern Indian Ocean; S.W. Atlantic; Weddell

Sea; p. 54: *P. rubrum* synonym of *P. haeckeli*. Kramp 1957*b*, pp. 158, 162: Indian Ocean and Antarctic Sea. Petersen 1957, p. 44: N. Atlantic. Kramp 1959*a*, pp. 51, 186, 253, 254, 256, 260, 261, fig. 272: Bay of Biscay; off west coast of Africa; West Indies; diagnosis; distribution.

Pantachogon militare (Maas 1893)

7–10 mm wide, 6 mm high, mitre-shaped, with a well developed apical projection; gonads lancet-shaped, on distal half of the eight radial canals; 48 tentacles all alike. Four (or more?) statocysts.

Maas 1893, p. 16, Pl. 1, fig. 1: as *Homoeonema militare* n.sp.; N. of Bermudas. Mayer 1910, p. 387, text-fig. 235: as *H. militare*; Mediterranean. Bigelow 1913, p. 44: *Pantachogonon militare*. Broch 1929, p. 501, text-fig. 13: as *H. militare*. ?Thiel 1931, p. 326: as *H. militare*; Weddell Sea, Antarctic. Thiel 1935*b*, p. 37: =*H. typica*, and probably =*P. rubrum*. Thiel 1936*b*, p. 24: =*P. rubrum*. Kramp 1947, pp. 15, 19: discussion. Kramp 1959*a*, pp. 52, 186, 253, 256, 263, fig. 273: off west coast of Africa; diagnosis; distribution.

Pantachogon scotti Browne 1910

About 4 mm wide, a little broader than high, with thin jelly and without an apical projection; with strong musculature; stomach very small; four short lips; gonads linear, extending along proximal 2/3 of the eight radial canals; about 120 tentacles all alike; number of statocysts unknown.

Browne 1910, p. 36, Pl. 3, figs. 5, 6: *Pantachogon scotti* n.sp.; McMurdo Sound, Antarctic. Vanhöffen 1912, p. 378, text-fig. 16: Gauss Station, Antarctic. Thiel 1931, p. 329: as *P. rubrum*; Weddell Sea. Thiel 1932*b*, p. 477. Thiel 1936*b*, p. 24: *P. scotti* in part, =*P. rubrum*. Kramp 1957*a*, p. 55. Kramp 1959*a*, pp. 186, 242, 252, fig. 274: *P. scotti* a distinct species, has seen type-specimen.

Genus ***Persa*** McCrady 1857

Rhopalonematidae with a short gastric peduncle; with only two gonads, pendent, on the subumbrellar portions of two opposite radial canals; eight radial canals; with numerous long tentacles, all alike, each with a terminal knob; statocysts free, club-shaped.

Type-species: *P. incolorata* McCrady.

McCrady 1857, p. 206: *Persa* n.g. Mayer 1910, p. 406.

Persa incolorata McCrady 1857

2 mm wide, 3 mm high; umbrella with or without a small apical knob; lateral jelly thin; stomach tubular, elongated; four small, broadly rounded lips; gastric peduncle very retractile; two oval or sausage-shaped, pendent gonads near middle points of two opposite radial canals; up to 48 long tentacles with a terminal knob; eight statocysts.

McCrady 1857, p. 206, Pl. 12, fig. 3: *Persa incolorata* n.g., n.sp.; South Carolina, east coast of U.S.A. Mayer 1910, p. 408, text-figs. 261, 262: *P. incolorata*; North Carolina, U.S.A.; pp. 406, 407, text-figs. 259, 260: probably = *P. lucerna* Haeckel from Mediterranean and *P. dissogonima* Haeckel from Gibraltar and *Persa* sp. Haeckel from Naples. Thiel 1935*b*, p. 62: southern Atlantic. Weill, R. & M. 1935, pp. 371–9, text-figs. 1–4: as *Quadralaria pyramidalis* n.g., n.sp.; Mediterranean. Thiel 1936*b*, p. 43, map: southern Atlantic. Picard 1951*b*, pp. 20–3, text-fig.: *Quadralaria pyramidalis* Weill = *P. incolorata*; Marseilles and Villefranche, Mediterranean coast of France. Vannucci 1951*b*, p. 117: Brazil. Blackburn 1955, p. 418: S.E. Australian waters (first record outside the Atlantic). Kramp 1957*a*, pp. 60, 125: Gulf of Guinea, W. Africa. Kramp 1958*a*, p. 125: Villefranche, Mediterranean. Kramp 1959*a*, pp. 189, 242, 246, 248, 253, 255, 256, 259, 260, 263, fig. 283: diagnosis; distribution.

Genus ***Ransonia*** Kramp 1947

Rhopalonematidae with a high, conical bell (similar to *Aglantha*); with a long and narrow gastric peduncle; with eight radial canals; with linear gonads along the peduncular portions of the radial canals, not on subumbrella; with numerous tentacles all alike; statocysts unknown.

Type-species: *R. krampi* (Ranson).

Ranson 1932*b*, p. 1: as *Aglantha* in part. Kramp 1947, p. 12: *Ransonia* n.g.

Ransonia krampi (Ranson 1932)

15 mm high, 8 mm wide; conical, with thin walls and a small, solid, conical apical projection; gonads more or less discontinuous along the eight radial canals on the peduncle; about 88 tentacles; statocysts unknown.

Ranson 1932*b*, pp. 1–19, text-fig.: as *Aglantha krampi* n.sp.; near Gibraltar; Mediterranean. Ranson 1936*b*, p. 183, Pl. 2, fig. 21: as *A. krampi*; off Algeria, North Africa. Kramp 1947, p. 12: *Ransonia krampi* n.g. Kramp 1948*b*, p. 11: Mediterranean near Gibraltar (new record). Kramp 1955*a*, p. 274: Gulf of Guinea, W. Africa. Kramp 1959*a*, pp. 55, 190, 253, 255, 256, 260, 263, fig. 284: Straits of Gibraltar; off west coast of Africa; diagnosis; distribution.

Genus ***Rhopalonema*** Gegenbaur 1856

Rhopalonematidae without a gastric peduncle; with gonads along the eight radial canals separated from stomach; with tentacles of two kinds: radial clubs, and inter- and adradial cirri; with enclosed marginal statocysts.

Type-species: *R. velatum* Gegenbaur.

Gegenbaur 1856, pp. 245–51: as *Trachynema* and *Rhopalonema* n.g. Haeckel 1879, p. 263: as *Marmanema* n.g. Mayer 1910, p. 376. Kramp 1947, p. 12.

Rhopalonema funerarium Vanhöffen 1902

Up to 17 mm wide and 14 mm high, somewhat conical, without an apical projection; stomach narrow, elongated, hardly reaching velar opening; gonads linear, extending along distal 2/3 of radial canals; eight radial tentacles; eight interradial and 16 adradial cirrus-like, very small tentacles each with a globular terminal knob; 32 statocysts in middle of the spaces between tentacles and cirri; velum very broad.

VANHÖFFEN 1902, p. 61, Pl. 9, fig. 2, Pl. 10, fig. 17, Pl. 11, fig. 31: *Rhopalonema funerarium* n.sp.; off west coast of Africa and near St Paul in Indian Ocean. MAYER 1910, p. 380, text-fig. 223: as *R. coeruleum* Haeckel; (Mediterranean; tropical Atlantic, Indian and Pacific oceans). VANHÖFFEN 1912, p. 372: tropical Atlantic. BIGELOW 1917, p. 306: off Georges Bank, east coast of U.S.A. BIGELOW 1919, p. 323. KRAMP 1924, p. 22: *R. funerarium* different from *R. coeruleum* Haeckel; dimensions; S.W. of Ireland. BIGELOW 1926, pp. 54, 67: Gulf of Maine, U.S.A. BROCH 1929, p. 496; text-fig. 8: distribution. RANSON 1936*b*, p. 144: S.W. of and near the Azores; near Monaco. KRAMP 1947, p. 14, Pl. 2, figs. 4, 5, map: S.W. of Ireland; the locality Cadiz Bay (Kramp 1924) erroneous. KRAMP 1948*b*, p. 8, map: N.E. Atlantic to W. of Scotland. RUSSELL 1953, p. 434, text-figs. 285, 286. KRAMP 1957*a*, pp. 52, 53, 92, 104, 108, 126, text-fig. 19, map: with larvae of Narcomedusae; W. coast of Africa; S. Georgia. KRAMP 1957*b*, pp. 158, 162: Indian Ocean. VANNUCCI 1957*d*, p. 76. KRAMP 1959*a*, pp. 50, 74, 185, 253, 255, 256, 259, 260, 261, 263, 272, fig. 271: Bay of Biscay; off west coast of Africa; diagnosis; distribution.

Rhopalonema velatum Gegenbaur 1856

8–10 mm wide, somewhat flatter than a hemisphere, with a conical apical thickening; stomach narrow, elongated, reaching almost to velar opening; four short, simple lips; gonads linear or oval extending along middle 1/3 of radial canals; eight radial club-shaped tentacles; eight interradial and, in adult specimens, 16 adradial cirrus-like very small tentacles; a statocyst close beside each of the radial tentacles and the interradial cirri; velum very broad.

GEGENBAUR 1856, p. 251, Pl. 9, figs. 1–5: *Rhopalonema velatum* n.g., n.sp.; Mediterranean. HAECKEL 1879, p. 263, Pl. 17, figs. 1, 2: as *Marmanema clavigerum* n.sp.; tropical Atlantic; p. 264, Pl. 17, figs. 3–6: as *R. coeruleum* n.sp.; p. 264: as *R. velatum*; p. 265, Pl. 17, figs. 7–11: as *R. polydactylum* n.sp. MAAS 1893, p. 15, Pl. 1, figs. 3, 4: as *R. striatum* n.sp.; tropical Atlantic. MAYER 1910, p. 378, text-figs. 213–19: *R. velatum*; Naples, Mediterranean; (tropical Atlantic, Indian and Pacific oceans); p. 379, text-fig. 220: as *R. polydactylum*; (Mediterranean, Sea of Marmora); p. 380, text-figs. 221, 222: as *R. coeruleum*, = *funerarium*; (Mediterranean; tropical Atlantic, Indian and Pacific oceans); p. 381, text-fig. 224: as *R. striatum*; (tropical Atlantic); p. 382, Pl. 49, figs. 1–1″, text-fig. 225: as *R. clavigerum*; (tropical Atlantic). NEPPI & STIASNY 1911, p. 399: Trieste, Adriatic Sea. NEPPI 1912, p. 730, Pl. 4, fig. 9: description; Dalmatian coast, Adriatic Sea. VANHÖFFEN 1912, p. 371: southern and northern Atlantic and Indian Ocean. BIGELOW 1913, p. 44: Japan. NEPPI & STIASNY 1913*b*, p. 79, Pl. 4, fig. 38: Trieste. VANHÖFFEN 1913*a*, p. 426: *R. velatum*, = *clavigerum*; Tortugas, Florida. VANHÖFFEN 1913*b*, p. 29: central and eastern Pacific. BIGELOW 1914*b*, p. 20: New England, east coast of U.S.A. MAYER 1915*a*, p. 202, Pl. 2, fig. 4: Torres Strait, Australia. BIGELOW 1915*b*, pp. 269, 316: off Delaware Bay, east coast of U.S.A. BROWNE 1916*a*, p. 193: discussion, *R. velatum* non = *funerarium*, non = *coeruleum*; Chagos Islands, Mauritius, Farquhar Islands and Amirante Islands, all Indian Ocean. BIGELOW 1917, p. 306: off Georges Bank, east coast of U.S.A. Bigelow 1918, p. 388: from Chesapeake Bay to Bermudas, Bahamas and Florida; p. 433, map: distribution in Atlantic. Pell 1918, pp. 22, 28: Adriatic Sea; pp. 22, 23, 27: as *Trachynema funerarium*. Bigelow 1919, p. 323: Philippines. Neppi 1920*b*, p. 91, text-fig. 5: abnormal specimen; Naples. Bigelow 1922, p. 157: S. of Martha's Vineyard, east coast of U.S.A. Foerster 1923, p. 265: from Lower California to Guatemala. Kramp 1924, p. 23, map: Mediterranean and Bay of Cadiz; biology; *R. coeruleum* different from *funerarium*. Ranson 1925*a*, p. 89, map: Mediterranean and adjacent Atlantic. Ranson 1925*b*, p. 381: Mediterranean and adjacent Atlantic. Bigelow 1926, p. 54: Gulf of Maine, east coast of U.S.A. Uchida 1928*b*, p. 77, text-fig. 1: to subfamily Rhopalonematinae nov.; Japan. Broch 1929, p. 495, text-fig. 7: *R. velatum*, report; p. 496: *R. coeruleum* Browne 1906 = *R. velatum*; p. 497: *R. coeruleum* Maas 1905 = *R. funerarium*; text-figs. 9, 10: as *R. clavigerum* and *striatum*. Davidoff 1936, p. 469: southern China. Ranson 1936*b*, p. 137: *R. velatum*, incl. *coeruleum*; discussion; many localities in the western Mediterranean; the area between Canary Islands, Azores, Madeira and Morocco. Thiel 1936*b*, pp. 10, 14, map of distribution: *R. velatum*, = *R. striatum*, *polydactylum*, *funerarium*, *coeruleum* and *clavigerum*. Bigelow 1938, p. 113: Bermudas. Pell 1938, p. 925: Adriatic Sea. Kramp 1947, p. 13, map: northern Atlantic. Uchida 1947*b*, p. 336: Japan. Babnik 1948, pp. 41, 70, 71: biology; Adriatic Sea. Kramp 1948*a*, p. 9: tropical Atlantic. Kramp 1948*b*, p. 7, map: northern Atlantic. Fraser & Saville 1949*b*, pp. 61, 63: Scotland. Moore 1949, pp. 7, 91, tab.: Bermudas. Ranson 1949, p. 130: Senegal, W. Africa. Fraser 1950, p. 95: N. and W. of Scotland. Rossi 1950, p. 26: Golfo di Rapallo, Italy. Vannucci 1951*b*, pp. 113, 115, 117: Brazil. Fraser 1952*a*, p. 34: Scotland-Faroe area. Kramp 1953, p. 299: Great Barrier Reef, Australia. Russell 1953, p. 430, text-figs. 283, 284. Chiu 1954*b*, p. 55. Fraser 1954*a*, p. 31: Scottish area. Fraser 1954*b*, p. 100: near Shetland Islands. Bernard 1955*b*, p. 13: Bay of Algeria, Morocco. Blackburn 1955, p. 414: S.E. Australian waters. Fraser 1955, pp. 4, 7, 9, 12: British Isles. Hure 1955, p. 6: Adriatic Sea. Kramp 1955*a*, p. 272: off West Africa north of Equator; pp. 308, 309: synonyms: *Trachynema octonarium* and *R. coeruleum* Haeckel from Canary Islands, *Marmanema clavigerum* from Canary Islands and off N.W. Africa, *M. velatoides* Maas from N.W. Africa. Fraser 1956, p. 53: W. of Scotland. Alvariño 1957*b*, p. 26: Atlantic coast of Spain and Portugal. Kramp 1956*a*, pp. 2, 3: off coast of Colombia; east tropical Pacific. Kramp 1957*a*, pp. 52, 53, 91, 110 ff., 125: with larvae of Narcomedusae; warm parts of all oceans. Vannucci 1957*d*, pp. 75, 93, 96, 97, 99, 102, figs. 22, 23 (map and diagram): Brazil; discussion. Ganapati & Nagabhushnam 1958, pp. 93, 94: Vizagapatam coast, India. Kramp 1958*a*, p. 124: Villefranche, Mediterranean. Kramp 1958*b*, p. 368: the Nicobars. Yamazi 1958, p. 137: Tanabe Bay, Japan. Kramp 1959*a*, pp. 47, 74, 185, 242–6, 250, 252, fig. 270: Atlantic Ocean; diagnosis; distribution. Kramp 1959*b*, p. 12: West Africa; Bay of Biscay.

Genus ***Sminthea*** Gegenbaur 1856

Rhopalonematidae without a gastric peduncle; with globular gonads on the eight radial canals; with only eight radial tentacles; with enclosed marginal statocysts.

Type-species: *S. eurygaster* Gegenbaur.

Gegenbaur 1856, p. 245: *Sminthea* n.g., to family Eucopidae. Mayer 1910, p. 382.

Sminthea (?) *arctica* Hartlaub 1909

Doubtful species.

Hartlaub 1909*c*, p. 466, Pl. 76, fig. 2: as *Trachynema arctica*; between Spitzbergen and Greenland. Broch 1929, p. 499: *Sminthea* (?) *arctica*. Thiel 1932*a*, p. 152: *S. arctica*. Thiel 1932*b*, pp. 444 ff.: *S. arctica*. Thiel 1936*b*, p. 17: as *S. eurygaster*.

Sminthea eurygaster Gegenbaur 1856

Up to 6 mm wide and about half as high, with a small apical gelatinous projection; stomach short; four very short lips; gonads close to the ring canal; eight marginal statocysts.

Gegenbaur 1856, p. 245, Pl. 9, figs. 14, 15: *Sminthea eurygaster* n.g., n.sp.; Mediterranean. Haeckel 1879, p. 260: as *Trachynema eurygaster*. Mayer 1910, p. 383, text-figs. 226, 227: *S. eurygaster*; (warm parts of the Atlantic). Grobben 1915, p. 5: Adriatic Sea. Neppi 1915, p. 5: Adriatic Sea. Browne 1916*a*, p. 194: N. of and at the Chagos Archipelago; Amirante Islands, Indian Ocean. Pell 1918, pp. 22, 28: Adriatic Sea. Broch 1929, p. 499, text-fig. 11: distribution. Thiel 1935*b*: southern Atlantic. Ranson 1936*b*, p. 145: the Azores. Thiel 1936*b*, p. 17, map: =*S. arctica* (Hartlaub); southern Atlantic. Pell 1938, p. 926: Adriatic Sea. Vannucci 1951*b*, p. 117: Brazil. Blackburn 1955, p. 415: S.E. Australian waters. Kramp 1955*a*, p. 308: *Marmanema mammaeforme* Haeckel from Canary Islands. Kramp 1957*a*, pp. 55, 125; Gulf of Guinea and W. of Cape of Good Hope, Africa. Kramp 1958*b*, p. 368: west of Ceylon. Kramp 1959*a*, pp. 54, 187, 242, 246, 248, 251, 253, 255, 256, 259, 260, 263, fig. 276: near Sicily in Mediterranean; off west coast of Africa; diagnosis; distribution.

Genus ***Stauraglaura*** Haeckel 1879

Rhopalonematidae with a well developed stomachal peduncle; with only four gonads, situated on the peduncle on every other of the eight radial canals, four radial canals being without gonads.

Type-species: *S. tetragonima* Haeckel.

Haeckel 1879, p. 277: *Stauraglaura* n.g.

Stauraglaura tetragonima Haeckel 1879

12 mm high, 8 mm wide, bell-shaped, with a small, conical apical projection; peduncle long and slender; stomach small, four very short lips; four large, spherical gonads on the peduncle, near stomach; 60–80 tentacles; four statocysts. Probably =*Aglaura hemistoma*.

Haeckel 1879, p. 277, Pl 16, figs. 10, 11: *Stauraglaura tetragonima* n.g., n.sp.; coast of Australia. Mayer 1910, p. 406, text-fig. 258. Kramp 1953, p. 309: probably = *Aglaura hemistoma*, in which four of the gonads are not developed (not lost!).

Genus ***Tetrorchis*** Bigelow 1909

Rhopalonematidae without a gastric peduncle; with only four gonads attached to four of the eight radial canals; gonads sausage-shaped, pendent; with four large perradial and several small tentacles.

Type-species: *T. erythrogaster* Bigelow.

BIGELOW 1909*a*, p. 123: *Tetrorchis* n.g.

Tetrorchis erythrogaster Bigelow 1909

10–12 mm wide, 8 mm high, pyriform, apex very thick, lateral jelly thin; stomach tubular, reaching slightly beyond velar level; four small lips; gonads attached to four of the eight radial canals near their middle points; four large perradial tentacles opposite to the four gonad-bearing radial canals, and 16–24 small tentacles; statocysts unknown; stomach a brilliant carmine.

BIGELOW 1909*a*, p. 124, Pl. 29, figs. 1–3: *Tetrorchis erythrogaster* n.g., n.sp.; eastern tropical Pacific. MAYER 1910, p. 388. THIEL 1936*b*, p. 39: tropical Atlantic. KRAMP 1957*a*, pp. 60, 99, 126: Gulf of Guinea, W. Africa; west of Cape of Good Hope. KRAMP 1959*a*, pp. 55, 189, 253, 256, 263, 272, fig. 282: off the Gulf of Guinea, W. Africa; diagnosis; distribution.

Order NARCOMEDUSAE

Hydromedusae with sides of umbrella divided by peronial grooves so that umbrella margin may be lobed; with broad stomach with entire circular periphery or with peripheral pouches; without radial canals, and with or without a peripheral canal system; with gonads on stomach walls; with solid marginal tentacles leaving umbrella some distance above margin, and sometimes small secondary tentacles on margin itself; sense organs free sensory clubs with endodermal axis.

Family *AEGINIDAE*

Narcomedusae with interradial, divided stomach pouches containing the gonads; with or without peripheral canal system; with primary perradial tentacles leaving umbrella between marginal pouches; pouches extending beyond points of origin of primary tentacles; with or without secondary tentacles on umbrella margin; with or without otoporpae.

Genus ***Aegina*** Eschscholtz 1829

Aeginidae with typically eight, occasionally 10 or 12, stomach pouches; with peripheral canal system; with typically four, occasionally five or six, primary tentacles and same number of peronia; without secondary tentacles; without otoporpae.

Type-species: *Ae. citrea* Eschscholtz.

ESCHSCHOLTZ 1829, p. 113: *Aegina* n.g. HAECKEL 1879, pp. 314, 315, 337, 351: as *Cunantha* (in part), *Cunarcha, Aegina* and *Solmundus.* MAYER 1910, p. 449. BIGELOW 1913, p. 58: discussion. BIGELOW 1938, p. 130: discussion.

Aegina citrea Eschscholtz 1829

Up to 50 mm wide, hemispherical, jelly thick at apex; stomach large, circular; typically eight rectangular stomach pouches, sometimes with a small median notch; typically four tentacles issuing about midway between apex and margin, a peronial strand from each tentacle base to margin of umbrella, dividing the margin into four lappets; numerous marginal statocysts; five- or six-rayed specimens occur rather frequently.

ESCHSCHOLTZ 1829, pp. 113, 115, Pl. 10, fig. 3, Pl. 11, fig. 4: *Aegina citrea* and as *Ae. rosea* n.g., n.spp. HAECKEL 1879, p. 315: as *Cunarcha aeginoides* n.sp.; Canary Islands; p. 338: *Ae. citrea* and as *Ae. rosea*; *Ae. rhodina* n.sp.; Canary Islands; p. 339: as *Ae. eschscholtzii* n.sp.; the Azores. VANHÖFFEN 1908*a*, p. 50, Pl. 1, fig. 3: as

Ae. lactea n.sp.; southern Atlantic; p. 51, Pl. 1, fig. 4: as *Ae. brunnea* n.sp.; Indian Ocean. Bigelow 1909*a*, p. 74, Pl. 17, fig. 1: as *Ae. alternans* n.sp.; off coast of Peru-Equador. Kishinouye 1910, p. 32, Pl. 5, fig. 34: as *Ae. pentanema* n.sp.; Japan. Mayer 1910, p. 451, text-figs. 299, 300: *Ae. citrea*; (tropical Pacific); p. 452, Pl. 52, fig. 5, Pl. 54, figs. 11–11‴: as *Ae. rhodina*; (Canary Islands); Bahamas; (S. of Cape Verde Islands); p. 453: as *Ae. eschscholtzii* (Azores), *brunnea* (Indian Ocean) and *alternans* (east Pacific); p. 454: as *Ae. aeginoides* (Canary Islands; Azores); p. 726: *Ae. pentanema* Kishonouye = *Ae. citrea.* Vanhöffen 1912, p. 388: as *Ae. rosea*; southern Atlantic; Indian Ocean south of Madagascar. Bigelow 1913, p. 58: *Ae. lactea* and *brunnea* doubtful species; *Ae. rhodina* probably = *rosea*; p. 59: *Ae. alternans* abnormal specimen of *rosea*; *Ae. rosea*, different from *Ae. citrea*; Bering Sea; *Ae. citrea*; San Francisco, California; Japan. ?Browne 1916*a*, p. 200: Chagos Archipelago, Indian Ocean. Bigelow 1919, p. 330: *Ae. citrea*; Philippines; as *Ae. rosea*; Celebes. Foerster 1923, p. 268: *Ae. citrea*; as *Ae. rosea*; Vancouver. Kramp 1924, p. 37: as *Ae. rhodina*; S.W. of Ireland. Ranson 1925*b*, p. 382: off coast of Portugal. Uchida 1928*b*, p. 91, fig. 8: as *Ae. rosea*; Japan; p. 91: *Ae. pentanema* = *rosea*; p. 92: *Ae. citrea*, reference to Bigelow 1913. Broch 1929, p. 530, fig. 34: as *Ae. rosea,* = *Ae. rhodina* Mayer 1910, Kramp 1924; p. 530, fig. 35: *Ae. citrea*; distribution. Thiel 1932*a*, p. 155: as *Ae. rosea.* Thiel 1932*b*, pp. 445 ff.: as *Ae. rosea*; distribution. Thiel 1935*b*: as *Ae. rosea*; southern Atlantic. Dawydoff 1936, p. 469: as *Aegina*; Indochina. Ranson 1936*b*, p. 209: *Ae. citrea*; different from *rosea*; off Canary Islands. Thiel 1936*b*, p. 73: *Ae. rhodina* and *citrea* = *rosea,* the only species of *Aegina*; southern Atlantic (map). Bigelow 1938, p. 131: *Ae. citrea,* = *rosea*; morphological marks; Bermudas. Bigelow 1940, p. 313: Pacific coast of Costa Rica and Colombia. Kramp 1947, p. 36, map: N.E. Atlantic. Uchida 1947*a*, p. 314: as *Aegina* sp.; Palao Islands, central Pacific. Uchida 1947*b*, p. 341: as *Ae. rosea*; Japan. Kramp 1948*b*, p. 15: northern Atlantic. Moore 1949, p. 9: as ?*Aegina* sp.; Bermudas. Vannucci 1951*b*, pp. 112, 114, 116: as *Ae. rosea*; Brazil. Yashnov 1952, p. 96: as *Ae. rosea*; off Kamchatka. Russell 1953, p. 467, Pl. 28, fig. 1, text-figs. 308–10: S.W. of Ireland. Chiu 1954*b*, p. 55. Blackburn 1955, p. 422: S.E. Australian waters. Kramp 1955*a*, p. 281: Gulf of Guinea; off Liberia; pp. 308, 309: = *Cunarcha aeginoides, Ae. rhodina* and *Solmundus tetralinus* Haeckel from Canary Islands; ? = *Ae. canariensis* Haeckel from Canary Islands and N.W. Africa. Naumov 1956*b*, p. 38: as *Ae. rosea.* Kramp 1957*a*, pp. 63, 110 ff., 125: Atlantic from Portugal to S. Georgia; S. and E. of Madagascar. Kramp 1957*b*, pp. 159, 162: off South Africa; Antarctic Sea. Petersen 1957, p. 42: N. Atlantic. Vannucci 1957*d*, pp. 81, 95, 96, 99, 101, 102, 103, fig. 24 (map): Brazil. Kramp 1958*b*, p. 370: the Nicobars. Yamazi 1958, p. 136: as *Ae. rosea*; Tanabe Bay, Japan. Kramp 1959*a*, pp. 61, 194, 242, 243, 246, 250, 253, 256, 259, 261, fig. 294: Atlantic Ocean; Gulf of Panama; diagnosis; distribution.

Genus ***Aeginodiscus*** Haeckel 1879

Aeginidae with 16 peronial strands, eight tentacles and 32 (16 cleft) peripheral stomach pouches.

Type-species: *Ae. actinodiscus.*

Haeckel 1879, p. 344: *Aeginodiscus* n.g. Mayer 1910, p. 486.

Aeginodiscus actinodiscus Haeckel 1879

40 mm wide, 13 mm high, lenticular; 16 peronial strands; mouth with four

triangular lips; 32 (16 cleft) rectangular stomach pouches; eight tentacles. Description insufficient.

HAECKEL 1879, p. 344: *Aeginodiscus actinodiscus* n.g., n.sp.; Zanzibar, E. Africa. MAYER 1910, p. 486.

Genus ***Aeginopsis*** Brandt 1835

Aeginidae with 16 stomach pouches; peripheral canal system absent; with four primary tentacles and twice as many peronia; without secondary tentacles; without otoporpae.

Type-species: *Ae. laurentii* Brandt.

BRANDT 1835, p. 22: *Aeginopsis* n.g. HAECKEL 1879, p. 342. MAYER 1910, p. 472.

Aeginopsis laurentii Brandt 1838

Up to 25 mm wide, hemispherical or somewhat conical, apex thick, lateral walls very thin; stomach broad, lenticular; 16 rectangular stomach pouches (eight primary pouches deeply cleft); four large primary tentacles issuing at a very high level; four perradial and four interradial peronia; 2–3 statocysts in each octant.

BRANDT 1838, p. 363, Pl. 6, figs. 1–6: *Aeginopsis laurentii* n.g., n.sp. HAECKEL 1879, pp. 242, 243: *Ae. laurentii* and *mertensii* n.sp. BIGELOW 1909*b*, p. 314, Pl. 32, figs. 2–6: Newfoundland and Labrador. HARTLAUB 1909*c*, p. 472, Pl. 76, figs. 7, 8: off N.E. Greenland. MAYER 1910, pp. 472, 498, text-fig. 309*a*: (Arctic southward to Japan and New England, U.S.A.). KRAMP 1914, p. 434: W. and E. Greenland. BIGELOW 1920, p. 11, Pl. 2, fig. 3: Alaska. FOERSTER 1923, p. 269. KRAMP & DAMAS 1925, p. 320: Norway. ?UCHIDA 1928*b*, p. 93: *Ae. laurentii*, =*Ae. mertensii* from Japan Sea. BROCH 1929, p. 534, text-fig. 38: report of distribution. THIEL 1932*a*, p. 156. THIEL 1932*b*, pp. 445 ff.: distribution in Arctic. KRAMP 1933*b*, p. 16: E. Greenland. BERNSTEIN 1934, pp. 9, 26: Kara Sea. RANSON 1936*b*, p. 212: east coast of Spitzbergen. YASHNOV 1939, pp. 112, 114: Chukotski Sea; East Siberian Sea; Laptev Sea; Kara Sea. DUNBAR 1942, p. 74: eastern arctic Canada. KRAMP 1942, p. 97: W. Greenland. KRAMP 1943, p. 8: E. Greenland. KRAMP 1947, p. 36: Greenland. YASHNOV 1948, p. 74, Pl. 21, fig. 5*a*, *b*: Polar Sea north of U.S.S.R. VIBE 1950, p. 103: N.W. Greenland. KRAMP 1955*b*, p. 161. BOGOROV 1956, p. 310: Barents Sea. NAUMOV 1956*b*, p. 38. PETERSEN 1957, p. 42: E. Greenland. GRAINGER 1959, pp. 472, 496: Iglooik, arctic Canada. KRAMP 1959*a*, pp. 195, 242, 253, 254, 262, fig. 296: diagnosis; distribution.

Genus ***Aeginura*** Haeckel 1879

Aeginidae with 16 stomach pouches; peripheral canal system degenerate or absent; with eight primary tentacles and same number of peronia; with secondary tentacles on umbrella margin; without otoporpae.

Type-species: *Ae. grimaldii* Maas 1904.

HAECKEL 1879, pp. 317, 343: as *Cunoctona* for *C. lanzerotae* n.sp. (larval form), and *Aeginura* n.g., for *Ae. myosura* n.sp., both doubtful species. MAYER 1910, p. 467. BIGELOW 1913, p. 60: discussion, *Cunoctona* Haeckel 1879 and Vanhöffen 1908. BIGELOW 1938, p. 132: discussion. BIGELOW 1940, p. 309: discussion.

Aeginura beebei Bigelow 1940

100 mm wide, 18 mm high, discoidal; 11 antimeres; 22 gastric pouches, interradial notches much deeper than the perradial; 11 primary tentacles; on the margin of each of the 11 lappets 1–3 small secondary tentacles and 2–6 statocysts; gastric walls pale purplish (in formalin).

BIGELOW 1940, p. 309, text-figs. 17–20: *Aeginura beebei* n.sp.; Pacific coast of Panama.

Aeginura grimaldii Maas 1904

Up to 45 mm wide, hemispherical, central part fairly thick; stomach large, circular; 16 rectangular stomach pouches with indications of slight median clefts; primary tentacles large, at level of top of stomach, a peronial strand from each tentacle base to margin of umbrella; 3–5 small secondary tentacles on umbrella margin in each octant; one or two statocysts between adjacent secondary tentacles; colour of stomach and its pouches deep chocolate or purplish black.

MAAS 1904, p. 38, Pl. 3, figs. 19–28: *Aeginura grimaldii* n.sp.; North Atlantic. ?MAYER 1910, p. 468: as *Ae. myosura* Haeckel 1879; p. 469: as *Ae. lanzerotae* (Haeckel 1879). MAYER 1910, p. 470, text-figs. 307–9: *Ae. grimaldii*, =*Ae. weberi* Maas 1905; (Malay Archipelago; eastern tropical Pacific). BIGELOW 1913, p. 61: Bering Sea; east coast of Kiushiu Islands; Surugu Gulf; east coast of Hondu, Japan. KRAMP 1913*a*, p. 276: Davis Strait. KRAMP 1914, p. 436: Davis Strait. KRAMP 1920*b*, p. 6: northern Atlantic. FOERSTER 1923, p. 269. KRAMP 1924, p. 37: Portugal. BIGELOW 1926, p. 67: off Gulf of Maine, east coast of U.S.A. UCHIDA 1928*b*, p. 93. BROCH 1929, p. 533, text-fig. 37: distribution. THIEL 1932*a*, p. 156. THIEL 1932*b*, pp. 445 ff.: distribution. THIEL 1935*b*, p. 37: as *Ae. lanzerotae*, incl. *grimaldii* and *weberi*; southern Atlantic. RANSON 1936*b*, p. 211: *Ae. grimaldii*, =*Cunoctona guinensis* and *obscura* Vanhöffen 1908*a* and *weberi* Maas; Azores; between Azores and Gibraltar; off Cape Finisterre, N.W. Spain; off Portugal; off Gironde, Bay of Biscay; between Azores and America. THIEL 1936*b*, p. 86, map: distribution. LING 1937, p. 361, text-fig. 19: description; Chekiang coast, China. BIGELOW 1938, p. 132: discussion of name; Bermudas. BIGELOW 1940, p. 313: Pacific coast of Panama. KRAMP 1942, p. 100: Davis Strait. KRAMP 1947, p. 38, map: northern Atlantic. KRAMP 1948*b*, p. 16, map: northern Atlantic. VANNUCCI 1951*a*, pp. 106, 107, 112, 113: as *Ae. lanzerotae*; Brazil. RUSSELL 1953, p. 472, text-figs. 311, 312: S.W. of Ireland. CHIU 1954*a*, pp. 41, 46, Pl. 5, figs. 19, 20: Amoy, China. CHIU 1954*b*, pp. 50, 51, 52: China. KRAMP 1955*a*, p. 282: off Liberia; p. 307: *Cunoctona lanzerotae* from Canary Islands a doubtful synonym. NAUMOV 1956*b*, p. 38. KRAMP 1957*a*, pp. 64, 100, 104, 126: off W. coast of Africa; between Zanzibar and Somaliland, East Africa. PETERSEN 1957, p. 44: N.W. Atlantic. NICOL 1958, p. 715: Bay of Biscay. KRAMP 1959*a*, pp. 62, 195, 253–6, 259, 261, fig. 295: Bay of Biscay; S.W. of the Azores; off northern part of west coast of Africa; diagnosis; distribution.

Genus ***Solmundella*** Haeckel 1879

Aeginidae with eight stomach pouches; without peripheral canal system;

with four peronia, but only two tentacles; without secondary tentacles; without otoporpae.

Type-species: *S. bitentaculata* (Quoy & Gaimard).

HAECKEL 1879, pp. 340, 349, 352: *Aeginella* and *Solmundella* n.g. MAYER 1910, p. 454.

Solmundella bitentaculata (Quoy & Gaimard 1833)

Up to 12 mm wide, usually much smaller, higher than wide, apical jelly very thick; stomach broad, lenticular; stomach pouches rectangular; two opposite very long tentacles issuing from umbrella near apex, which is keeled along the axis leading to the tentacles; the two tentacular peronia are deposited in deep grooves; usually 8–16 statocysts, but sometimes up to 32.

QUOY & GAIMARD 1833, p. 295, Pl. 25, figs. 4, 5: as *Charybdea bitentaculata* n.sp. MÜLLER 1851, p. 272, Pl. 11: as *Aeginopsis mediterranea* n.sp. HAECKEL 1879, pp. 309, 348, 352: as *Solmundella mediterranea* n.g.; p. 341: as *Aeginella bitentaculata*. BROWNE 1910, p. 38: as *S. mediterranea*; Antarctic. MAYER 1910, p. 455, text-figs. 301, 302: *S. bitentaculata*; (tropical Atlantic, Indian and Pacific oceans; Antarctic); new record: Florida; p. 456, Pl. 54, figs. 1–3, Pl. 55, fig. 4: as *S. bitentaculata* var. *mediterranea*; (tropical Atlantic, Indian and Pacific oceans; Mediterranean; Antarctic); new records: Fiji Islands; Florida. ZALENSKIJ 1911, pp. 1–49, text-figs. 1–37: as *S. mediterranea*; Mediterranean. NEPPI 1912, p. 732: as *S. bitentaculata* var. *mediterranea*; Adriatic Sea. VANHÖFFEN 1912, p. 392: comparison with *S. mediterranea*; Antarctic; tropical Atlantic and Indian oceans. BIGELOW 1913, p. 63: Sea of Okhotsk; Japan. NEPPI & STIASNY 1913*b*, p. 82: as *S. bitentaculata* var. *mediterranea*, *Aeginella dissonema* Haeckel; Trieste. VANHÖFFEN 1913*a*, p. 428: Tortugas, Florida. VANHÖFFEN 1913*b*, p. 32: Gibraltar; south of Rio de Janeiro; Antofagasta, Chile; Peru; Panama; Galapagos Islands; Hong Kong, China. MAYER 1914*a*, p. 4: Tortugas, Florida. MAYER 1915*a*, p. 160: as *S. mediterranea*; Torres Strait, Australia. BROWNE 1916*a*, p. 201: as *S. mediterranea*, possibly a variety of *bitentaculata*; Indian Ocean: N. of Chagos; Chagos Archipelago; Farquhar Group; Amirante Islands. BROWNE 1916*b*, p. 152: Okhamandal, N.W. India. BIGELOW 1918, p. 399: Straits of Florida. BIGELOW 1919, p. 331: Philippines. FOERSTER 1923, p. 269. STIASNY 1928*b*, p. 224: Samarang, Java Sea. UCHIDA 1928*a*, p. 93, text-fig. 9: Japan. BROCH 1929, p. 531, text-fig. 36: distribution. MENON 1931, p. 503: Madras, India. THIEL 1931, p. 321: as *S. mediterranea*, comparison with *S. bitentaculata*; Weddell Sea. MENON 1932, p. 28: Madras, India. THIEL 1932*a*, p. 155. THIEL 1932*b*, pp. 445 ff.: distribution. LELE & GAE 1935, p. 99: Bombay, India. THIEL 1935*b*: southern Atlantic. DAWYDOFF 1936, p. 469: Indochina. THIEL 1936*b*, p. 68: *S. mediterranea* synonym of *bitentaculata*; southern Atlantic. LING 1937, p. 362, text-figs. 20, 21: description; Chekiang coast, China. UCHIDA 1938*a*, p. 147: Japan. MENON 1945, p. 41: Trivandrum coast, India. UCHIDA 1947*a*, p. 314: Palao Islands, Pacific. BABNIK 1948, p. 47: as *S. bitentaculata* var. *mediterranea*; Adriatic Sea. BERRILL 1950, p. 299, text-fig. 4, O-S: as *S. bitentaculata* var. *mediterranea*; development. ROSSI 1950, p. 27: as *S. mediterranea*; Golfo di Rapallo, Italy. NAIR 1951, p. 70: Trivandrum coast, India. VANNUCCI 1951*b*, p. 117: Brazil. BAL & PRADHAN 1952, p. 76: Bombay, India. KRAMP 1952, p. 10: Chile. GEORGE 1953, p. 82: Calicut, southern India. KRAMP 1953, p. 302: N.E. Australia. CHIU 1954*a*, p. 46, Pl. 5, fig. 18: Amoy, China. CHIU 1954*b*, pp. 50, 51, 52, 55:

China. BLACKBURN 1955, p. 422: S.E. Australian waters. KRAMP 1955*a*, p. 282: Gulf of Guinea; p. 308: = *Aeginella dissonema* Haeckel and *S. mülleri* Haeckel from Canary Islands; p. 309: = *S. mediterranea*. KRAMP 1956*a*, p. 4: eastern tropical Pacific. NAUMOV 1956*b*, p. 38. KRAMP 1957*a*, pp. 64, 98, 110 ff., 125: W. and S. Africa; Brazil; S. Sandwich to Falkland Islands; W. of Graham Island, Antarctic. VANNUCCI 1957*d*, pp. 79, 95, 96, 99, 101, 102, figs. 24, 25 (map and diagram): Brazil. GANAPATI & NAGABHUSHANAM 1958, p. 93: Vizagapatam coast, India. KRAMP 1958*a*, p. 126: Villefranche, Mediterranean. KRAMP 1958*b*, p. 369: Mergui Archipelago and Nicobars, Indian Ocean; Orissa coast, India. YAMAZI 1958, p. 137: Tanabe Bay, Japan. KRAMP 1959*a*, pp. 63, 195, 242, 246, 250, 252, fig. 297: Straits of Gibraltar; off west coast of Africa; West Indies; diagnosis; distribution. KRAMP 1959*b*, p. 12: West Africa.

Family *SOLMARISIDAE*

Narcomedusae without stomach pouches, the genital products being developed either as thickenings or diverticula in the oral wall of the central stomach; with or without peripheral canal system; with numerous tentacles leaving umbrella at level of periphery of stomach; with or without otoporpae.

Genus ***Pegantha*** Haeckel 1879

Solmarisidae with gonads forming diverticula of the margin of the oral wall of the stomach; with peripheral canal system; with otoporpae.

Type-species: *P. martagon* Haeckel.

HAECKEL 1879, pp. 332, 353: as *Polyxenia, Pegasia, Pegantha* n.g. and *Solmoneta* n.g. MAYER 1910, p. 439: ? = *Polyxenia* Eschscholtz 1829; *Pegantha* is used instead of the older synonyms *Polyxenia* and *Pegasia*, which have been inaccurately described. VANHÖFFEN 1913*b*, p. 31: separation between *Pegantha* and *Polyxenia*. BIGELOW 1918, p. 394: *Pegantha*, incl. *Polyxenia* and *Polycolpa* Vanhöffen; discussion; limitation of species very difficult. BIGELOW 1940, p. 303: discussion of the name; *Pegantha* is retained, though *Pegasia* (or *Polyxenia*) possibly may have priority. KRAMP 1957*a*, p. 65: *Pegantha* is stated; revision of the genus; seven species may be recognized.

Pegantha aureola (Haeckel 1879)

30 mm wide, 8 mm high; 32 lappets, rectangular, one and a half times as long as broad, each with three statocysts; gonads oval sacs with swollen, wart-like projections over surface; 32 tentacles. The species is unrecognizable.

HAECKEL 1879, p. 354, Pl. 19, fig. 11: as *Solmoneta aureola* n.sp.; Red Sea. MAYER 1910, p. 440, table, text-fig. 292. KRAMP 1957*a*, p. 66: the species unrecognizable.

Pegantha biloba Haeckel 1879

25 mm wide, 6 mm high; 12–13 marginal lappets, horse-shoe-shaped, somewhat longer than broad and with 30–40 statocysts on each lappet: mar-

ginal lappets with three pointed, granulated ribs; gonads with two lobes; probably = *P. triloba*.

Haeckel 1879, p. 333: *Pegantha biloba* n.sp.; Honolulu, Hawaii. Bigelow 1918, p. 395: probably = *P. triloba*. Kramp 1957*a*, p. 66: probably = *P. triloba*.

Pegantha clara R. P. Bigelow 1909

Up to 50 mm wide and 20 mm high, jelly thick, lenticular, smooth; up to 40 marginal lappets, continuously increasing in number during growth of the individual, quadrate or somewhat longer than broad, usually tongue-shaped, each with 3–5 statocysts and long, linear otoporpae, usually as long as the lappets; peripheral canals fairly narrow, of almost equal width throughout their length; gonads a simple, smooth or somewhat crenulated pouch in each lappet radius.

R. P. Bigelow 1909, p. 80, two text-figs.: *Pegantha clara* n.sp.; off Woods Hole, east coast of U.S.A. H. B. Bigelow 1909*a*, p. 90, Pl. 14, figs. 1, 2, Pl. 19, figs. 1–9, Pls. 22–6: as *P. smaragdina* n.sp.; with larvae; eastern tropical Pacific. Mayer 1910, p. 445, text-fig. 298A: *P. clara*; p. 446: as *P. smaragdina*. Hanitzsch 1911, p. 225: as *P. smaragdina*. ?Vanhöffen 1912, p. 390, fig. 23: as *Polyxenia* sp.; Cape Verde Islands; South Atlantic; Madagascar. Vanhöffen 1913*b*, p. 32: *P. clara* and *smaragdina* are considered = *Polycolpa forskalei*; off Pacific coast of South America; between Sandwich Islands and Carolines. Bigelow 1914*b*, p. 21. Bigelow 1918, p. 397: *P. clara* (= *P. smaragdina* H. B. Bigelow 1909 and *Polycolpa forskalei* Vanhöffen 1908*a*, 1912, 1913*b*, non Haeckel 1879); Bahamas. Bigelow 1938, p. 134: ?*P. clara*; Bermudas. Bigelow 1940, p. 305, text-figs. 15, 16: *P. clara*, probably = *P. smaragdina*; Pacific coast of Colombia. Kramp 1947, p. 33, text-fig. 12, Pl. 4, fig. 7, Pl. 5, figs. 1–10: medusae—and larvae in *Periphylla*; northern Atlantic. ?Kramp 1948*b*, p. 15: S. of Azores. Berrill 1950, p. 299, text-fig. 4A–E (*P. clara*) and 4F–K (*P. smaragdina*); development. Kramp 1957*a*, pp. 66, 67, 69, 73, 110 ff., 125, text-figs. 12, 13, Pl. 6, fig. 3: morphology and variation; = *P. clara* and *smaragdina* Berrill 1950; Indian Ocean between S. Africa and Australia; off E. Africa; Atlantic Ocean from 31° N. to 37° S. Kramp 1955*b*, p. 161: by Haeckel determined as *Polyxenia* ?sp. Kramp 1959*a*, pp. 66, 198, 242, 243, 246, 250, fig. 304: off west coast of Africa; between the Azores and West Indies; Bermudas; diagnosis; distribution.

Pegantha cyanostylis (Eschscholtz 1829)

40–50 mm wide, 20–30 mm high, flat and bell-shaped; 16–18 lappets twice as long as broad, somewhat rectangular, each with 13–30 statocysts; gonads a half-moon-like, folded sac in each lappet cavity; 16–18 tentacles. The species is unrecognizable.

Eschscholtz 1829, p. 119, Pl. 10, fig. 1*a–c*: as *Polyxenia cyanostylis* n.sp.: N. of the Azores. Mayer 1910, p. 445: *Pegantha cyanostylis*, = *Polyxenia cyanolina* Haeckel; (tropical Atlantic). Vanhöffen 1913*b*, p. 31: *Polyxenia cyanostylis*; north of Caroline Islands, Pacific; identification uncertain. Bigelow 1918, p. 398: *Polyxenia cyanostylis* Vanhöffen 1913 ? = *Pegantha dactyletra*. Kramp 1957*a*, p. 66: the species is unrecognizable.

Pegantha dactyletra Maas 1893

25–30 mm wide, doubly convex; exumbrella with 32 radial ridges; 16 five-cornered lappets with 5–7 statocysts; each gonad a sac-like body with five finger-shaped processes; 16 tentacles; probably = *P. tribola.*

Maas 1893, p. 47, Pl. 5, figs. 1–8: *Pegantha dactyletra* n.sp.; central Atlantic. Mayer 1910, p. 444, text-fig. 298. ?Bigelow 1918, p. 398: Straits of Florida. Kramp 1957*a*, p. 66: probably = *P. triloba.*

Pegantha dodecagona (Péron & Lesueur 1809)

40 mm wide, 12 mm high, cap-shaped, smooth; 12 semicircular lappets, each with 10–12 statocysts; inner gonad a small, simple ring, the outer 12 simple, large, egg-shaped sacs; 12 tentacles. The species unrecognizable.

Péron & Lesueur 1809, p. 341: as *Pegasia dodecagona* n.g., n.sp.; southern Atlantic. Mayer 1910, p. 444: *Pegantha dodecagona.* Bigelow 1918, p. 396: possibly = *P. martagon.* Kramp 1957*a*, p. 66: the species unrecognizable.

Pegantha forskåli (Haeckel 1879)

20 mm wide, 7 mm high, flat and discoidal; 25 rectangular marginal lappets, twice as long as broad; 5–7 statocysts on each lappet; gonads very wide and swollen, in the subumbrella wall around the periphery of the stomach, and without blind pouches into the marginal lappets. Not observed since Haeckel.

Haeckel 1879, p. 328: as *Polycolpa forskalii* n.sp.; Red Sea. Mayer 1910, p. 437: as *Solmaris forskalii*; (tropical Pacific, Indian and Atlantic oceans, erroneous); Cape Verde Islands. ?Vanhöffen 1912, p. 391: as *Polycolpa forskali.* Thiel 1936*b*, p. 58: = *S. flavescens.* Russell 1953, p. 477: doubtful synonym of *S. corona.* Kramp 1957*a*, p. 66: is provisionally referred to *Pegantha.*

Pegantha godeffroyi (Haeckel 1879)

6 mm wide, 3 mm high, hemispherical, smooth; 14 lappets, semicircular, each with 2–3 statocysts; gonad a wide annulus, with star-like, octagonal outline; 24 coffee-bean-shaped saccules in subumbrella floor of stomach, three in each octant; 14 tentacles, short and thick. The species unrecognizable.

Haeckel 1879, p. 355, Pl. 19, fig. 12: as *Solmaris godeffroyi* n.sp.; Samoa, Pacific. Mayer 1910, p. 441, table: *Pegantha godeffroyi.* Kramp 1957*a*, p. 66: the species unrecognizable.

Pegantha laevis H. B. Bigelow 1909

Up to about 40 mm wide, flat, lenticular, smooth; 16–22 (up to 26) marginal lappets, about as long as broad with rounded corners, each with 5–7 statocysts; otoporpae shorter or slightly longer than the width of the transverse portion of the peripheral canals; canals very broad, especially in their lateral regions, of nearly the same width from their base to the outer edge of the lappet; gonads when fully developed sac-shaped with oval or papilliform processes.

Bigelow 1909*a*, p. 97, Pl. 16, fig. 1, Pl. 20, figs. 4–6, Pl. 27, figs. 1–7: *P. laevis* n.sp.; eastern tropical Pacific; Hawaii. Mayer 1910, p. 444. Bigelow 1918, p. 396: ? = *P. dactyletra*. Ranson 1949, p. 135: as *P. cyanogramma*; tropical Atlantic. Berrill 1950, p. 301, fig. 4n–l: development, report. Kramp 1955*a*, p. 279: north of Cape Verde Islands. Kramp 1955*b*, p. 160: by Haeckel determined as *Cunina*? sp., *Aegineta* sp. and *Polyxenia* ? sp. Kramp 1957*a*, pp. 66, 67, 69, 70, 73, 110 ff., 125, text-fig. 11, map, Pl. 6, fig. 2: = *P. cyanogramma* Ranson 1949; morphology and variation; S.E. coast of Africa; S.E. and S.W. Atlantic Ocean; Cape Verde Islands. Kramp 1959*a*, pp. 66, 198, 242, 246, 250, 252, fig. 303: Bay of Biscay; off northern part of west coast of Africa; west of the Azores; diagnosis; distribution. Kramp 1959*b*, p. 13: Angola, West Africa.

Pegantha lunulata (Haeckel 1879)

16–20 mm wide, 4–5 mm high; 24 lappets, rectangular, somewhat longer than broad, each with 5–6 statocysts; gonads half-moon-shaped sacs; 24 tentacles.

Haeckel 1879, p. 354: as *Solmoneta lunulata* n.sp.; Canary Islands, Atlantic. Mayer 1910, p. 440, table: *Pegantha lunulata*. Kramp 1955*a*, p. 307: reference to Haeckel. Kramp 1957*a*, pp. 66, 76; ?? = *P. clara*.

Pegantha magnifica Haeckel 1879

50 mm wide, 12 mm high; exumbrella with conical nematocyst warts; 30 lappets, tongue-shaped or horse-shoe-shaped, each with three radiating ridges and 30–35 statocysts; gonads 5–8 egg-shaped sacs of various sizes in each lappet-radius.

Haeckel 1879, p. 333: *Pegantha magnifica* n.sp.; tropical Pacific. Mayer 1910, p. 440 (table). Kramp 1957*a*, p. 66: is provisionally retained.

Pegantha martagon Haeckel 1879

Up to 30 mm wide, usually about 20 mm, hemispherical or higher, jelly thick, smooth; about 16 marginal lappets about as long as broad, square or evenly rounded, each with 5–7 (or 9) statocysts; otoporpae short and narrow, about twice as long as the width of the transverse portion of the peripheral canals; transverse portion of canals fairly narrow, lateral portions broad proximally, tapering distally; gonads simple or irregularly lobed sacs.

Haeckel 1879, p. 332: *Pegantha martagon* n.g., n.sp.; China Sea. Bigelow 1904, p. 260, Pl. 5, figs. 19, 20: as *P. simplex* n.sp.; Maldive Islands, Indian Ocean. Mayer 1910, p. 443, text-figs. 295, 296: (tropical Pacific and Indian oceans; China Sea). Bigelow 1918, p. 395: *P. martagon* a valid species, = *P. simplex* Bigelow 1904, different from *triloba*. Bigelow 1940, p. 308: ?*P. martagon*; Gulf of Panama. Kramp 1955*a*, p. 277: S. of Canary Islands. Kramp 1955*b*, p. 160: by Haeckel determined as *Polyxenia*? and *Cunina* sp. Kramp 1957*a*, pp. 66, 67, 98, 110 ff., 125, text-fig. 10, map, Pl. 6, fig. 1: morphology; southern Pacific and Indian oceans; W. of Graham Land, Antarctic; round South Georgia; Atlantic Ocean from 24° N. to 39° S.; coast of East Africa from 8° S. to 35° S. Kramp 1959*a*, pp. 64, 197, 242, 246, 250, 252, fig. 302: off west coast of Africa; Azores; Gulf of Panama; diagnosis; distribution. Kramp 1959*b*, p. 13: West Africa.

Pegantha mollicina (Forskål 1775)

40 mm wide, 13 mm high, cap-shaped; 11–12 lappets, rectangular, one and a half as long as broad, each with 5–6 statocysts; gonads with simple, egg-shaped sacs. The species is unrecognizable.

Forskål 1775, p. 109, Pl. 33, fig. C: as *Medusa mollicina* n.sp.; Mediterranean. Haeckel 1879, p. 329: as *Polyxenia mollicina*; Smyrna, Turkey. Bigelow 1918, p. 396: ? = *Pegantha martagon.* Kramp 1957*a*, p. 66: ?? = *P. martagon*; the species unrecognizable.

Pegantha pantheon Haeckel 1879

20 mm wide, 10 mm high; a deep coronal furrow between central disk and marginal zone of lappets; exumbrella with numerous branched ribs and deep radial furrows; 18 marginal lappets, oval, about half as broad as long, each with 23–25 statocysts, otoporpae oval; gonads sac-like, folded; 18 tentacles; probably = *P. triloba.*

Haeckel 1879, p. 332: *Pegantha pantheon* n.sp.; Philippines. Mayer 1910, p. 442. Bigelow 1918, p. 395: probably = *P. triloba.* Kramp 1957*a*, p. 66: probably = *P. triloba.*

Pegantha punctata (Quoy & Gaimard 1824)

90 mm wide, 25 mm thick, shield-shaped; 24 semicircular lappets, each with 6–9 statocysts; gonad: a ring of subumbrellar saccules, one in each lappet radius, and also diffusely developed over the ectodermal floor of the subumbrella under the stomach; 24 short, thick tentacles. The species unrecognizable.

Quoy & Gaimard 1824, p. 564, Pl. 85, fig. 4: as *Aequora punctata* n.sp.; Hawaii, Pacific. Mayer 1910, p. 444: *Pegantha punctata.* Kramp 1957*a*, p. 66: the species unrecognizable.

Pegantha quadriloba Haeckel 1879

20 mm wide, 7 mm high; 13–16 marginal lappets, egg-shaped, a little longer than broad; 22–25 statocysts on each lappet; gonads with four lobes, the two median ones the largest; probably = *P. triloba.*

Haeckel 1879, p. 333: *Pegantha quadriloba* n.sp.; Ascension, tropical Atlantic. Mayer 1910, p. 443: probably = *P. triloba.* Bigelow 1918, p. 395: probably = *P. triloba.* Kramp 1957*a*, p. 66: probably = *P. triloba.*

Pegantha rubiginosa (Kölliker 1853)

Up to about 16 mm wide, dome-shaped, jelly very thick, smooth; 12–16 marginal lappets, rectangular with rounded corners, each with four or six statocysts; the two middle otoporpae long and narrow, frequently longer than the lappet, the lateral ones shorter; peripheral canals very narrow throughout their length; gonads without radial diverticula.

Kölliker 1853, p. 322: as *Eurystoma rubiginosum* n.g., n.sp. Mayer 1910, p. 480, text-figs. 319–21: as *Cunina prolifera*; synonyms; (Mediterranean). Grobben 1915, p. 5: as *C. prolifera.* Neppi 1915, p. 5: as *C. prolifera*; Adriatic Sea. Bigelow 1918, p. 392: *C. prolifera* a doubtful species. Caziot 1921, p. 114: as *C. prolifera*; Villefranche-sur-Mer, French Mediterranean coast. Kramp 1924, p. 37, map: as *C. rubiginosa*; discussion of the name; Mediterranean. Ranson 1925*a*, p. 91: as *C. prolifera*; W. of N. Africa. Ranson 1925*b*, p. 382: as *C. prolifera*; off Portugal. Broch 1929, p. 525, text-fig. 31: as *C. rubiginosa.* Thiel 1935*b*: as *C. rubiginosa* in part; southern Atlantic. Damas 1936*a*, pp. 1177–97, text-figs.: as *C. lativentris,* larvae parasitic in *Tomopteris*; Bay of Biscay; Atlantic W. of Straits of Gibraltar. Ranson 1936*b*, p. 199: as *C. rubiginosa,* =*rhododactyla*; between the Azores and America. Thiel 1936*b*, p. 77, map: as *C. rubiginosa* in part; discussion of the species of *Cunina*; tropical and southern Atlantic. Bigelow 1940, p. 303: *C. prolifera* is referred to family Solmaridae. Berrill 1950, p. 303, text-fig. 5D–H: as *C. prolifera*; text-fig. 6M–C: as *C. lativentris*; development. Vannucci 1951*b*, pp. 106, 112, 113: as *C. rubiginosa*; Brazil. Blackburn 1955, p. 423: as *C. rubiginosa*; S.E. Australian waters. Kramp 1955*a*, p. 280: belongs to *Pegantha*; S. of Canary Islands. Ebbecke 1957, p. 151: as *C. rhododocatylos*; reflex investigations; Naples. Kramp 1957*a*, pp. 66, 67, 73, 76, 98, 125, Pl. 6, fig. 4: synonyms; S.W. of Cape Verde Islands. Kramp 1958*a*, p. 126: Villefranche, Mediterranean. Kramp 1959*a*, pp. 67, 198, 242, 244, 248, 251, fig. 305: Mediterranean; off west coast of Africa; between the Azores and West Indies; diagnosis; distribution.

Pegantha sieboldi (Haeckel 1879)

20 mm wide, 10 mm high, crown-shaped; 12 lappets, each with 16–18 statocysts; exumbrella with 12 deep, radiating furrows arranged in pairs; outer gonad 12 half-moon-shaped pouches, each divided into four minor lappets, the two median largest; 12 tentacles; probably =*P. triloba.*

Haeckel 1879, p. 331: as *Pegasia sieboldii* n.sp.; tropical Atlantic. Mayer 1910, p. 444: *Pegantha sieboldii,* ? =*P. dodecagona* Péron & Lesueur from southern Atlantic. Bigelow 1918, p. 395: probably =*P. triloba.* Kramp 1957*a*, p. 66: probably = *P. triloba.*

Pegantha triloba Haeckel 1879

Up to 30 mm wide, hemispherical or somewhat flatter, jelly very rigid, exumbrella with deep radiating furrows from tentacle bases nearly to apex, surrounded by ribs and supplementary ridges; 12–16 tentacles and 12–16 marginal lappets, ovate, pointed, each with up to 20 statocysts; otoporpae long, tapering upwards; gonads with 2–4 lobes projecting into the lappet cavities.

Haeckel 1879, p. 333, Pl. 19, figs. 4–7: *Pegantha triloba* n.sp.; Zanzibar, E. Africa. Bigelow 1909*a*, p. 87, Pl. 14, fig. 3, Pl. 16, fig. 3, Pl. 20, figs. 1–3, Pl. 45, figs. 1, 2: eastern tropical Pacific. Mayer 1910, p. 443, text-figs. 293, 294, 297: (tropical Pacific, Indian and Atlantic oceans). ?Vanhöffen 1912, p. 389, text-fig. 22: E., N. and N.W. of Ascension; W. of St Helena; equatorial Atlantic; Antarctic. ?Vanhöffen 1913*b*, p. 30, Pl. 1, figs. 11, 12: Balearics, Mediterranean; between Cape Verde Islands and Pernambuco; Fernando Noronha N.E. of Pernambuco; between Pernambuco and Abrolhos Islands; from Arica to Calao, Peru; Galapagos Islands; N.W. of Callao; between Sandwich Islands and Carolines; Arabian Sea. Bigelow 1918, p. 395: remarks. Kramp 1948*a*, p. 11: N.W. of South Georgia. Kramp 1948*b*, p. 15: S.W. of the Azores. Ranson 1949, p. 134: central tropical Atlantic. Kramp 1955*b*, pp. 159, 160: =*Aegineta*? Haeckel 1879 and ?=*Pegasia sieboldii* Haeckel 1879. Kramp 1957*a*, pp. 66, 67, 77, 98, 125: *P. triloba*, probably =*P. biloba, quadriloba, pantheon* and *Pegasia sieboldii* Haeckel; *Pegantha dactyletra* Maas 1893 ? = *P. triloba*; morphological remarks; Gulf of Guinea, W. Africa; between S. Africa and S. America; p. 91, Pl. 7, figs. 3, 4: larvae of ? *P. triloba*. Kramp 1959*a*, pp. 68, 198, 242, 246, 250, 251, 252, fig. 306: between West Africa and Brazil; West Indies; diagnosis; distribution.

Pegantha weberi (Haeckel 1879)

50 mm wide, 16 mm high, shield-shaped; 27 lappets, rectangular, each with one statocyst; gonad on nearly entire subumbrella wall of stomach, and divided into eight wedge-shaped marginal lappets by eight radial furrows; 27 tentacles, thin. The species is unrecognizable.

Haeckel 1880, p. 638: as *Solmaris weberi* n.sp.; tropical Pacific. Mayer 1910, p. 441, table: *Pegantha ? weberi.* Kramp 1957*a*, p. 66: the species unrecognizable.

Pegantha zonaria (Haeckel 1879)

12 mm wide, 4 mm high; 10–12 lappets, as long as broad, each with 6–8 statocysts; gonad a simple, narrow ring. The species is unrecognizable.

Haeckel 1879, p. 327: as *Polycolpa zonaria* n.g., n.sp.; Mediterranean. Bigelow 1918, p. 396: ? =*Pegantha martagon.*

Pegantha zonorchis (Haeckel 1879)

16 mm wide, 4 mm high; 17 lappets, pentagonal, as long as broad; 11–13 statocysts on each lappet; gonad a broad ring. The species is unrecognizable.

Haeckel 1879, p. 327: as *Polycolpa zonorchis* n.sp.; tropical Atlantic.

Genus **Solmaris** Haeckel 1879

Solmarisidae with simple annular gonad; without peripheral canal system; without otoporpae.

Type-species: *S. rhodoloma* (Brandt).

Haeckel 1879, p. 355: *Solmaris* n.g. Mayer 1910, p. 432. Thiel 1936*b*, p. 58: discussion of species. Kramp 1953, p. 303: discussion of synonyms of *S. flavescens*.

Solmaris corona (Keferstein & Ehlers 1861)

12–15 mm wide, flat, lens-shaped; lappets rectangular, about twice as long as broad, usually with two statocysts mounted on a large cushion with long bristles; up to 36 long tentacles.

Keferstein & Ehlers 1861, p. 94, Pl. 14, figs. 7–9: as *Aegineta corona* n.sp.; Mediterranean. Haeckel 1879, pp. 358, 359, Pl. 20, figs. 7–10: as *Solmaris corona* and *S. coronantha* n.sp; Mediterranean and Canary Islands. Mayer 1910, p. 437, text-figs. 288, 289: (Ireland, Norway). Int. Plankt. Catal. 1916, p. 44: northern Atlantic; Ireland. Kramp & Damas 1925, p. 319: Shetland Islands; Norway. Broch 1929, p. 535, text-fig. 39. Mar. Biol. Ass. 1931, p. 83: Plymouth. Ranson 1936*b*, p. 213: Balearics, Mediterranean. Thiel 1936*b*, p. 58: =*S. flavescens.* Kramp 1937*b*, p. 134, text-fig. 61. Russell 1938*b*, pp. 413, 416, 417: Plymouth. Kramp 1947, p. 35, map: northern Atlantic. ?Uchida 1947*a*, p. 314: Palao Islands, central Pacific. Kramp 1948*b*, p. 14: W. and N. of Scotland. Kramp 1953, p. 303: *S. rhodoloma* non =*corona.* Russell 1953, p. 476, Pl. 28, fig. 2, text-figs. 313, 314: Plymouth; Ireland. Kramp 1955*a*, p. 276: Gulf of Guinea; p. 308: =*S. coronantha*, report of Haeckel 1879. Kramp 1957*a*, pp. 77, 98, 125: near Cape of Good Hope; Durban. Petersen 1957, p. 42: N. Atlantic between Ireland and Newfoundland. Kramp 1959*a*, pp. 197, 242, 243, 244, 246, 247, 251, fig. 301: diagnosis; distribution.

Solmaris flavescens (Kölliker 1853)

15–23 mm wide, flat and lens-shaped, thick; marginal lappets thin, quadratic, each with usually two statocysts; 12–17 (usually 13–15) tentacles.

Kölliker 1853, p. 322: as *Pachysoma flavescens* n.g., n.sp.; Mediterranean. Haeckel 1879, p. 353: as *Solmoneta flavescens.* Mayer 1910, p. 434, text-figs. 284–6: *Solmaris flavescens.* ?Vanhöffen 1912, p. 394: =*Solmissus marchalli* and *incisa*, *Solmaris rhodoloma*; tropical Atlantic. ?Vanhöffen 1913*b*, p. 33: Gibraltar; Hong Kong, China. Ranson 1925, p. 382: Mediterranean. ? Thiel 1935*b*: southern Atlantic. ?Thiel 1936*b*, p. 58, map, text-fig. 12*a*, *b*: synonyms: *S. leucostyla, mucilaginosa, rhodoloma, solmaris, vanhöffeni, forskalii, corona,* non =*rhodoloma* Uchida 1928; southern Atlantic. Berrill 1950, p. 299: development. ?Vannucci 1951*b*, pp. 107, 113, 114: Brazil. Kramp 1953, p. 303: discussion of the synonyms of Vanhöffen and Thiel. Hure 1955, p. 8: Adriatic Sea. Kramp 1955*a*, p. 308: =*Solmoneta flavescens* from Canary Islands, report of Haeckel. Kramp 1959*a*, pp. 196, 242, 244, 247, 251, fig. 299: diagnosis; distribution.

Solmaris lenticula Haeckel 1879

5 mm wide, 3 mm high; marginal lappets semicircular, not quite half as long as diameter of stomach, each with three statocysts; gonad a wide annulus on nearly entire subumbrellar wall of stomach; 16 tentacles somewhat longer than bell-diameter.

Haeckel 1879, p. 357: *Solmaris lenticula* n.sp.; Indian Ocean. Mayer 1910, p. 438: probably an immature form. Nair 1951, p. 70: Trivandrum coast, India. Kramp 1953, p. 303: possibly a valid species. Ganapati & Nagabhushanam 1958, pp. 93, 94: Vizagapatam coast, India.

Solmaris leucostyla (Will 1844)

3 mm wide, flat to hemispherical; 12–36 tentacles and marginal lappets; the lappets are quadratic, each with usually one statocyst.

WILL 1844, p. 64, Pl. 2, figs. 1–4: as *Polyxenia leucostyla* n.sp.; Trieste, Adriatic Sea. HAECKEL 1879, p. 357: *Solmaris leucostyla*. METSCHNIKOFF 1886, p. 254, Pl. 23, fig. 29: Mediterranean. MAYER 1910, p. 433. NEPPI 1912, p. 732: coast of Dalmatia, Adriatic Sea. NEPPI & STIASNY 1913*b*, p. 81, Pl. 4, fig. 39: Trieste. THIEL 1936*b*, p. 58: =*S. flavescens*. BABNIK 1948, p. 48: Adriatic Sea. BERRILL 1950, p. 299: development. KRAMP 1959*a*, pp. 196, 242, 244, fig. 298: diagnosis; distribution.

Solmaris multilobata Maas 1893

As *S. corona*, but with more than 64 tentacles and lappets. Probably identical with or a mutant of *S. corona*.

MAAS 1893, p. 45, Pl. 4, figs. 7–13: *Solmaris multilobata* n.sp.; N. of the Hebrides, Scotland. MAYER 1910, p. 438, text-fig. 290: ? =*S. corona*. BROCH 1929, p. 536, text-fig. 40. THIEL 1936*b*, p. 60: doubtful species. KRAMP 1947, p. 36: discussion. RUSSELL 1953, p. 477: probably =*S. corona*. KRAMP 1959*a*, p. 197.

Solmaris rhodoloma (Brandt 1838)

2–7 mm wide, very flat, disk-like, thin and fragile; 17–32 tentacles; lappets varying in size, each with 1–2 statocysts.

BRANDT 1838*a*, p. 357, Pl. 3, figs. 1–5: as *Aequorea rhodoloma* n.sp.; Pacific coast of Chile. MAAS 1909, p. 39, Pl. 3, fig. 20: *Solmaris rhodoloma*; Sagami Bay, Japan. MAYER 1910, p. 437: ? =*S. corona*. UCHIDA 1928*b*, p. 85, text-fig. 5: *S. rhodoloma*; Misaki, Japan. THIEL 1936*b*, p. 58: =*S. flavescens*, (non *S. rhodoloma* Uchida 1928). KRAMP 1953, p. 302: discussion of species; *S. rhodoloma* probably a valid species; variation; Great Barrier Reef, Australia. BLACKBURN 1955, p. 421: remarks; S.E. Australian waters. KRAMP 1956*a*, pp. 3, 4: N.E. of Marquesas Islands, Pacific. ?YAMAZI 1958, p. 137: as *S. corona*; Tanabe Bay, Japan. KRAMP 1959*a*, p. 251.

Solmaris solmaris (Gegenbaur 1856)

35 mm wide, flat, concavo-convex; lappets quadratic, each with 6–8 statocysts; 18–20 tentacles.

GEGENBAUR 1856, p. 265, Pl. 10, figs. 4, 5, 10 (?): as *Aegineta solmaris* n.sp.; Mediterranean. HAECKEL 1879, p. 358: as *Solmaris gegenbauri*. MAYER 1910, p. 437, text-fig. 287: *S. solmaris*. KRAMP 1959*a*, pp. 196, 242, 244, fig. 300: diagnosis; distribution.

Solmaris vanhoeffeni Neppi & Stiasny 1911

0·5 mm wide, 1 mm high, almost hemispherical; lappets twice as broad as long, each with 1–3 statocysts; gonad well developed even in specimens with only six tentacles; 6–16 tentacles, very long.

NEPPI & STIASNY 1911, p. 398: *Solmaris vanhöffeni* n.sp.; Trieste, Adriatic Sea.

NEPPI 1912, p. 732: coast of Dalmatia, Adriatic Sea. NEPPI & STIASNY 1913*b*, p. 82, Pl. 4, fig. 40: Trieste. THIEL 1936*a*, p. 58: = *S. flavescens*. KRAMP 1959*a*, p. 197: perhaps the young of some other species.

Family *CUNINIDAE*

Narcomedusae with perradial and undivided stomach pouches; with or without peripheral canal system; with tentacles leaving umbrella opposite centre of each stomach pouch, equal in number to that of pouches; pouches not extending beyond points of origin of tentacles; without secondary tentacles on umbrella margin; with or without otoporpae.

Genus ***Cunina*** Eschscholtz 1829

Cuninidae with or without peripheral canal system; with otoporpae.

Type-species: *C. globosa* Eschscholtz.

ESCHSCHOLTZ 1829, p. 116: *Cunina* n.g. HAECKEL 1879, pp. 316, 318: as *Cunoctantha* n.g. and *Cunina*. MAYER 1910, pp. 460, 473: as *Cunoctantha* and *Cunina*. BIGELOW 1918, pp. 391, 392: possibly *Cunina* = *Cunoctantha*; discussion of species. THIEL 1936*b*, pp. 77 ff.: probably only one (or two) species of *Cunoctantha*. KRAMP 1953, p. 304: *Cunoctantha* = *Cunina*.

Cunina duplicata Maas 1893

Up to 58 mm wide, rather flat; up to 29 stomach pouches, increasing in number with age from nine in juvenile specimens, tongue-shaped or rectangular, somewhat longer than broad, with parallel sides, separated by spaces of about the same width or somewhat broader; the gonads form a continuous, folded band following the edge of the stomach with its pouches uninterruptedly; the stomach pouches are of unequal length and width, sometimes large and smaller ones alternating; marginal lappets rectangular, each with two or three statocysts; otoporpae very small; lateral portions of peripheral canals remarkably broad, transverse portion narrow.

MAAS 1893, p. 52, Pl. 5, figs. 9, 10: *Cunina duplicata* n.sp.; S. of Cape Verde Islands. BIGELOW 1909*a*, p. 57. MAYER 1910, p. 481, text-fig. 323. BIGELOW 1918, p. 393: may finally prove to belong to *C. lativentris*. THIEL 1936*b*, pp. 77, 79: ? = *C. rubiginosa*. BLACKBURN 1955, p. 423: S.E. Australian waters. KRAMP 1955*a*, p. 309: doubtful species; report of Maas. KRAMP 1957*a*, p. 86, Pl. 6, fig. 5, Pl. 7, figs. 1, 2: new description; development; *C. duplicata* a valid species; Mozambique Channel; S.E. of Africa; from Cape of Good Hope to Cape Verde Islands; Argentine; between South Georgia and Falkland Islands. KRAMP 1959*a*, pp. 70, 201, 242, 246, 248, 251, 252, fig. 313: off west coast of Africa; west of the Azores; north of Brazil; diagnosis; distribution.

Cunina fowleri (Browne 1906)

4 mm wide, watch-glass-shaped; eight stomach pouches, spindle-shaped; no peripheral canals; medusa-buds developing from stomach pouches projecting into bell cavity; eight marginal lappets rounded, each with five statocysts and long, narrow otoporpae.

Browne 1906, pp. 164, 177, Pl. 13, figs. 1, 2: as *Cunoctantha fowleri* n.sp.; Bay of Biscay. Mayer 1910, p. 466, text-fig. 306: as *Cunoctantha fowleri*. Broch 1929, p. 527, text-fig. 32: as *Cunoctantha fowleri*. Thiel 1936*b*, p. 82: =*Cunoctantha octonaria*. Berrill 1950, p. 303, text-fig. 6G: as *Cunoctantha fowleri*; development. Kramp 1957*a*, pp. 82, 83: *Cunina fowleri*. Kramp 1959*a*, pp. 199, 242, 247, 250, fig. 308: diagnosis; distribution.

Cunina frugifera Kramp 1948

About 8 mm wide, dome-shaped, apical jelly very thick; 6–9 stomach pouches, narrowing in width from base outwards, separated by wide triangular spaces; peripheral canals broad and flat; medusa-buds developing on subumbrella side of stomach pouches; no ectodermal pads below bases of tentacles; marginal lappets almost square, about as long as broad, each with four statocysts; otoporpae linear.

Kramp 1948*b*, p. 18, Pl. figs. 1–6: *Cunina frugifera* n.sp.; Cadiz Bay, S.W. of Spain. Kramp 1953, p. 304. Kramp 1955*a*, p. 285: Gulf of Guinea; Canary Islands. Kramp 1957*a*, pp. 82, 125: off Somali, E. Africa; S.E. of Africa; Cape of Good Hope; Cape Verde Islands; Uruguay, S. America. Kramp 1959*a*, pp. 69, 200, 242, 247, 251, fig. 311: off west coast of Africa; between the Azores and West Indies; diagnosis; distribution.

Cunina globosa Eschscholtz 1829

Up to 18 mm wide, conical or almost globular, jelly thick; stomach on a broad gelatinous peduncle; 10–14 stomach pouches, wide, quadratic with rounded angles, more than twice as wide as septa between them; peripheral canals well developed; the tentacles arise a short distance only above the margin; no ectodermal pad below bases of tentacles; marginal lappets short and broad, each with three statocysts; otoporpae short and oval.

Eschscholtz 1829, p. 117, Pl. 9, figs. 3*a–c*: *Cunina globosa* n.g., n.sp.; Gilbert Islands, tropical Pacific. Bigelow 1909*a*, p. 57, Pl. 15, fig. 3, Pl. 17, figs. 3, 8: Pacific coast of Mexico. Mayer 1910, p. 476, text-figs. 311, 312: ?=*Aegineta globosa* Gegenbaur from Mediterranean. Foerster 1923, p. 268. Thiel 1936*b*, p. 77: =*C. rubiginosa*. Naumov 1956*b*, p. 38. Kramp 1957*a*, pp. 81, 83, 97, 105, 125: ?=*C. lativentris*; remarks on morphology; near Cape of Good Hope. Petersen 1957, p. 42: west of English Channel. Kramp 1959*a*, pp. 201, 242, 243, 244, 249, 250, fig. 312: diagnosis; distribution.

Cunina lativentris Gegenbaur 1856

Similar to *C. globosa*, but stomach pouches narrow at base, broader near outer ends; marginal lappets with four statocysts; probably=*C. globosa*.

GEGENBAUR 1856, p. 260, Pl. 10, fig. 2: *Cunina lativentris* n.sp. MAYER 1910, p. 476, text-fig. 315: (Mediterranean; Atlantic). WEILL 1926*b*, p. 1358, text-fig. 2: nematocysts. ?DAMAS 1936*a*, pp. 1177–97, text-figs.: larva parasitic in *Tomopteris*. THIEL 1936*b*, p. 77: =*C. rubiginosa*. ?BERRILL 1950, p. 303, text-fig. 6M–S: development. CHIU 1954*b*, p. 55. KRAMP 1957*a*, pp. 81, 83, 84, 88: ? =*C. globosa* Eschscholtz; specimens of Damas 1936 probably erroneously identified. KRAMP 1959*a*, p. 201: probably =*C. globosa*.

Cunina mucilaginosa (Chamisso & Eysenhardt 1821)

60–70 mm wide, 30 mm high, hemispherical; gastric pouches quadratic; 20–24 tentacles. Unrecognizable species.

CHAMISSO & EYSENHARDT 1821, p. 360, Pl. 30, figs. 2, A, B: as *Medusa mucilaginosa* n.sp. DE BLAINVILLE 1834, p. 279: *Cunina mucilaginosa*. ?VANHÖFFEN 1908*a*, p. 59: as *Solmaris mucilaginosa*; tropical Atlantic, Indian and Pacific oceans. MAYER 1910, p. 481. RANSON 1936*b*, p. 200: off coast of Morocco. KRAMP 1957*a*, p. 81: unrecognizable species.

Cunina octonaria McCrady 1857

5–7 mm wide, somewhat flatter than a hemisphere; 7–9, usually eight, stomach pouches, broad, square, very close together; no peripheral canals; tentacles project about midway between margin and apex; a thick and broad pad of ectoderm below base of each tentacle; 2–5, usually three, statocysts on each marginal lappet; otoporpae small; larvae developed in stomach pouches or attached to other medusae.

MCCRADY 1857, p. 211, Pl. 12, figs. 4, 5: *Cunina octonaria* n.sp.; South Carolina, east coast of America. HAECKEL 1879, p. 316: as *Cunoctantha octonaria*. MAYER 1910, p. 461, Pl. 55, figs. 1, 2, text-figs. 304, 305: as *Cunoctantha octonaria*; tropical parts of all oceans; p. 464, Pl. 54, figs. 4–9: as *C. octonaria* var. *köllikeri* (Müller); (Brazil, Malayan Archipelago); p. 465: as *Cunoctantha parasitica* Metschnikoff 1881; (Mediterranean). HANITZSCH 1911, pp. 204–50, text-figs. 2–9, Pls. 7, 8: as *Cunina parasitica*; Villefranche, France; Naples, Italy. HANITZSCH 1912, pp. 281–309, text-figs. 1–11, 15, 18–21: as *Cunina parasitica*; Mediterranean. BIGELOW 1915*b*, p. 316: as *Cunoctantha octonaria*; off Cape May, U.S.A. BROWNE 1916*a*, p. 201: as *Cunina* sp.?; tropical Indian Ocean. FOERSTER 1923, p. 267: as *Cunoctantha octonaria*; Pacific coast of Mexico. MENON 1932, p. 29: as *Cunoctantha octonaria*; Madras, India. THIEL 1935*b*: as *Cunoctantha octonaria* in part; southern Atlantic. THIEL 1936*b*, p. 82, map: as *Cunoctantha octonaria* in part; only species of the genus; tropical and southern Atlantic. KRAMP 1948*b*, p. 18: as *Cunoctantha octonaria*; northern Atlantic. BERRILL 1950, p. 303, text-figs 6, A-F, H-L: as *Cunoctantha octonaria*; development. NAIR 1951, p. 71: as *Cunoctantha octonaria*; Trivandrum coast, India. VANNUCCI 1951*b*, pp. 112, 115, 116: as *Cunoctantha octonaria*; p. 464: as *C. octonaria* var. *köllikeri*; Brazil. KRAMP 1953, p. 304: *Cunina octonaria*; Great Barrier Reef, Australia; p. 305, Pl. 2, fig. 7: parasitic stolon-larva in *Liriope*. BLACKBURN 1955, p. 422: S.E. Australian waters. KRAMP 1955*a*, p. 284: from Canary Islands to Angola, W. Africa. KRAMP 1957*a*, pp. 81, 82, 83, 84, 125: *C. parasitica* Metschnikoff 1881 =*octonaria*; S.E. Africa; tropical E. and W. Atlantic; Chagos, Indian Ocean.

VANNUCCI 1957*d*, pp. 82, 95, 95, 97, 99, 101, 102, figs. 26, 27 (map and diagram): Brazil. KRAMP 1958*b*, p. 370: Mergui Archipelago, Indian Ocean. KRAMP 1959*a*, pp. 69, 199, 242, 244, 249, fig. 307: off west coast of Africa; north of the West Indies; diagnosis; distribution. KRAMP 1959*b*, p. 14: West Africa; Bay of Cadiz.

Cunina oligotis Haeckel 1879

10 mm wide and high, spherical; stomach pouches long and narrow; only one statocyst on each marginal lappet; 16 long tentacles. Doubtful species.

HAECKEL 1879, p. 319: *Cunina oligotis* n.sp.; Atlantic coast of S. Africa. MAYER 1910, p. 475, table. KRAMP 1957*a*, p. 81: unrecognizable species. KRAMP 1959*a*, p. 202.

Cunina peregrina Bigelow 1909

Up to 14 mm wide, highly arched, jelly thick; 8–14 (usually 12) stomach pouches, increasing in number with age, in adult specimens square or a little longer than wide, with narrow clefts between them, in younger specimens, with few antimeres, the stomach pouches are well separated and more or less rounded distally; no peripheral canals; ectodermal pad below base of tentacle small; marginal lappets short and broad, each with 4–10 statocysts; otoporpae narrow, linear.

BIGELOW 1909*a*, p. 59, Pl. 1, fig. 6, Pl. 15, figs. 1, 2, Pl. 28, figs. 1–7, Pl. 45, fig. 8: *Cunina peregrina* n.sp.; eastern tropical Pacific. MAYER 1910, p. 481. BIGELOW 1913, p. 58: Japan. BIGELOW 1918, p. 393: N. of Bahamas. FOERSTER 1923, p. 268: California. UCHIDA 1928*b*, p. 87: Kagoshima, Japan. THIEL 1936*b*, p. 77: ? = *C. rubiginosa*. KRAMP 1948*b*, p. 18; S.W. of the Azores. BERRILL 1950, p. 301, text-figs. 5, A-C: development. KRAMP 1955*a*, p. 282: from Canary Islands to Gulf of Guinea, W. Africa; Chagos, Indian Ocean. KRAMP 1956*a*, pp. 3, 5: eastern tropical Pacific. KRAMP 1957*a*, pp. 81, 84, text-fig. 15, map: remarks on morphology; Cape of Good Hope to Canary Islands; S.E. Africa; Mozambique Channel; pp. 91, 110 ff., 125, Pl. 7, figs. 5–7; ?as larvae of *C. peregrina*. KRAMP 1959*a*, pp. 70, 199, 242, 249, fig. 309: off west coast of Africa; west of the Azores; diagnosis; distribution. KRAMP 1959*b*, p. 14: West Africa.

Cunina polygonia (Haeckel 1879)

16 mm wide, 6 mm high; stomach wide and conical, four lips; gastric pouches pentagonal; marginal lappets hexagonal, seven statocysts on each lappet, the median one much larger. Doubtful species.

HAECKEL 1879, p. 317, Pl. 19, fig. 2: as *Cunoctantha polygonia* n.sp.; Corfu and Messina, Mediterranean. MAYER 1910, p. 465: as *Cunoctantha polygonia*. KRAMP 1959*a*, p. 202: doubtful species.

Cunina proboscidea E. & L. Metschnikoff 1871

Up to 57 mm wide, somewhat conical; stomach long, conical, on a large conical gelatinous peduncle; 9–14 stomach pouches, long, rectangular, separated by narrow spaces; peripheral canals degenerate; tentacles very short; marginal lappets bluntly rounded, each with 3–4 statocysts; otoporpae short, club-shaped; medusoid larvae in stomach of the medusa, parasitic larvae developing in *Geryonia*.

E. & L. Metschnikoff 1871, p. 66, Pl. 6, figs. 1–3: *Cunina proboscidea* n.sp.; Mediterranean. Mayer 1910, p. 476, text-figs. 316, 317: Naples, Italy. Hanitzsch 1911, pp. 212–24, text-fig. 1: development. Hanitzsch 1921, pp. 363–410, text-figs. 1–16: proliferation. Ranson 1936*b*, p. 200: Spanish Mediterranean coast. Thiel 1936*b*, p. 77: =*C. rubiginosa*. Berrill 1950, p. 301, text-fig. 5, I-P: development. Kramp 1957*a*, pp. 81, 83: remarks. Kramp 1959*a*, pp. 200, 242, 244, fig. 310: diagnosis; distribution.

Cunina tenella (Bigelow 1909)

7 mm wide, higher than a hemisphere, apical jelly very thick; stomach deep, lenticular; eight stomach pouches, nearly triangular, pointed; peripheral canals well developed; a thick and broad pad of ectoderm below the base of each tentacle; marginal lappets very short, broadly rounded, each with three statocysts; otoporpae small, linear.

Bigelow 1909*a*, p. 54, Pl. 15, fig. 4, Pl. 16, fig. 2, Pl. 17, figs. 6, 7: as *Cunoctantha tenella* n.sp.; off Pacific coast of Mexico. Mayer 1910, p. 467: as *Cunoctantha tenella*. Foerster 1923, p. 268. Thiel 1936*b*, p. 82: =*C. octonaria*. Naumov 1956*b*, p. 38: as *Cunoctantha tenella*; Okhotian Sea. Kramp 1957*a*, p. 81: *Cunina tenella*, a valid species.

Cunina vitrea Gegenbaur 1856

Gegenbaur 1856, p. 259, Pl. 10, fig. 1: *Cunina vitrea* n.sp., young medusa; Messina, Mediterranean. Mayer 1910, p. 476: =*C. proboscidea*. Kramp 1957*a*, p. 81: unrecognizable species.

Cunina sp. Kramp 1955

Kramp 1955*a*, p. 286, text-fig. 8: *Cunina* sp.; young specimens; Gulf of Guinea.

Cunina sp. Uchida 1928

1·5–3 mm wide; stomach flat, lappets with one (two) statocysts; 8–11 tentacles with a prominent pad below base; young specimens.

Uchida 1928*b*, p. 87, text-fig. 6: *Cunina* sp.; young specimen; Japan. Uchida 1947*a*, p. 314: southern Pacific.

Cunina sp. Vanhöffen 1912

Vanhöffen 1912, p. 391, fig. 24: as *Aegineta* (?) juv. South Atlantic.

Genus ***Cunissa*** Haeckel 1879

Cuninidae with nine or more tentacles and peronial strands; the primary gastric pouches are equal in number to tentacles, but are cleft by the insertions of the tentacles so as to appear to be twice as numerous as the tentacles; peripheral canals? otoporpae?

Type-species: *C. polyporpa* Haeckel.

HAECKEL 1879, pp. 322, 344: as *Cunissa* and *Aeginodorus* n.g. MAYER 1910, p. 485: *Cunissa*, incl. *Aeginodorus*.

Cunissa polyphera Haeckel 1879

30 mm wide, 10 mm high, flat, shield-shaped; 32 lappets, oval, each with 5–7 statocysts; 32 tentacles.

HAECKEL 1879, p. 323: *Cunissa polyphera* n.sp.; Zanzibar, Indian Ocean. MAYER 1910, p. 485, table.

Cunissa polyporpa Haeckel 1879

20 mm wide, 10 mm high, hemispherical; 16 lappets, semicircular, each with 12–15 statocysts; 16 short tentacles.

HAECKEL 1879, p. 322: *Cunissa polyporpa* n.g., n.sp.; Singapore. Indian Ocean. MAYER 1910, p. 485, table.

Genus **Solmissus** Haeckel 1879

Cuninidae without peripheral canal system; without otoporpae.

Type-species: *S. albescens* (Gegenbaur).

HAECKEL 1879, p. 349: *Solmissus* n.g. BIGELOW 1909*a*, p. 63. MAYER 1910, p. 482. KRAMP 1957*a*, p. 78 ff.: revision of *Solmissus*.

Solmissus albescens (Gegenbaur 1856)

25–30 mm wide, flat, lenticular, jelly thick at centre, thin at margin, exumbrella with scattered small, but distinct warts; 14–16 stomach pouches, somewhat wider than long, frequently pentagonal; marginal lappets nearly rectangular with rounded angles, each with 5–8 statocysts.

GEGENBAUR 1856, p. 260, Pl. 10, figs. 3, 4: as *Cunina albescens* n.sp.; Mediterranean. HAECKEL 1879, p. 350: *Solmissus albescens* n.g., and as *S. ephesius* n.sp.; Asia Minor, Mediterranean. MAYER 1910, p. 482, text-figs. 324–6: *S. albescens*; p. 482, table: *S. ephesius* = ?young medusa of *S. albescens*. NEPPI 1915, p. 3: as *S. ambiguus* n.sp.; Adriatic Sea. GROBBEN 1915, p. 3: as *S. ambiguus*. PELL 1918, pp. 22, 23, 30, text-fig. 6: Adriatic Sea. KRAMP 1924, p. 39, map: Mediterranean. BOONE 1933, p. 33, Pl. 5: off coast of Monaco. RANSON 1936*b*, p. 201: Mediterranean. PELL 1938, p. 929: Adriatic Sea. BERNARD 1955*a*, p. 7: Toulon, French Mediterranean coast. BERNARD 1955*b*, p. 13: Bay of Algiers, Morocco. HURE 1955, p. 8: Adriatic Sea. PÉRÈZ & PICARD 1955, p. 6: Toulon, Mediterranean. KRAMP 1957*a*, pp. 78, 79, 81: *S. ambiguus* = *albescens*; *S. ephesius* probably = young specimen of *albescens*. KRAMP 1959*a*, pp. 202, 253, 255, 263, fig. 314: diagnosis; distribution.

Solmissus bleekii Haeckel 1879

40 mm wide, 10 mm high, biconvex; gastric pouches rectangular; lappets rectangular, twice as long as wide, each with one statocyst; 32 tentacles. Doubtful species.

Haeckel 1879, p. 351: *Solmissus bleekii* n.sp.; Atlantic coast of South Africa. Mayer 1910, p. 482, table: = ?*S. incisa*. Kramp 1957*a*, p. 78: probably not = *S. incisa*.

Solmissus faberi Haeckel 1879

20 mm wide, 7 mm high, biconvex; 24 gastric pouches in the tentacular radii, heart-shaped, wide end distal, somewhat wider than long; 24 tentacles; lappets rectangular, somewhat wider than long, each with three statocysts. Doubtful species.

Haeckel 1879, p. 350: *Solmissus faberi* n.sp.; S.W. Atlantic. Mayer 1910, p. 483: ? = *S. incisa*. Kramp 1957*a*, p. 78: probably not = *S. incisa*.

Solmissus incisa (Fewkes 1886)

Up to 100 mm wide, flat, jelly soft and fragile, exumbrella smooth; 20–40 stomach pouches, oval in outline, usually somewhat longer than wide; marginal lappets rectangular, about as long as broad, each with 2–5 statocysts.

Fewkes 1886, p. 954, Pl. 9: as *Solmaris incisa* n.sp. Vanhöffen 1908*a*, p. 60: as *Solmaris rhodoloma*. Bigelow 1909*a*, p. 67, Pl. 21, figs. 1–3, 5: *Solmissus incisa*; eastern tropical Pacific. Mayer 1910, p. 483; (tropical Pacific Ocean; Gulf Stream). Bigelow 1913, p. 57: Bering Sea; Japan. Foerster 1923, p. 268. Uchida 1928*b*, p. 90: Bonin Island, Pacific Ocean. Broch 1929, p. 527, text-fig. 33: (tropical Atlantic and Pacific). Thiel 1932*a*, p. 155. Thiel 1932*b*, pp. 445 ff.: distribution. Ranson 1936*b*, p. 206: off mouth of Gironde and Santander, Bay of Biscay; off Canary Islands; off Cape Finisterre, Spain; S.W. of Nova Scotia; between the Azores and America. Bigelow 1938, p. 129: ?*S. incisa*; Bermudas. Uchida 1947*b*, p. 340: Japan. Kramp 1948*b*, p. 17: S.W. of Ireland; W. of Scotland. ?Moore 1949, p. 9: Bermudas; p. 91: ‘ Gulf Stream ’. Russell 1953, p. 464, text-figs. 305–7: W. of English Channel. Kramp 1955*a*, p. 287: Gulf of Guinea. Naumov 1956*b*, p. 38. Kramp 1957*a*, pp. 78, 79, 81: comparison with *S. marshalli*. Petersen 1957, p. 43: S.W. of Ireland. Kramp 1959*a*, pp. 72, 203, 253, 256, 259, 263, 272, fig. 316: Bay of Biscay; off W. Africa; Gulf of Panama; diagnosis; distribution.

Solmissus marshalli Agassiz & Mayer 1902

Up to 62 mm wide, flat, gelatinous disk thick and rigid, lappet zone very thin, exumbrella smooth; 8–20, usually about 16 stomach pouches, rectangular, about as long as wide or slightly longer; marginal lappets square, as broad as long, margin hardly, if at all, incised in the peronial radii, each with up to 15 statocysts; tentacles long.

Agassiz & Mayer 1902, p. 151, Pl. 5, figs. 23–5: *Solmissus marshalli* n.sp.; tropical Pacific. Bigelow 1909*a*, p. 64, Pl. 16, figs. 5, 6, Pl. 21, figs. 4, 6–8: eastern tropical Pacific. Mayer 1910, p. 484: (tropical Pacific, Indian and Atlantic oceans).

Vanhöffen 1912, p. 394: as *Solmaris flavescens*, =*Solmissus marshalli*, *incisa* and *Solmaris rhodoloma*; tropical Atlantic. Vanhöffen 1913*b*, p. 33: as *Solmaris flavescens*; Hong Kong, China. Bigelow 1919, p. 329: Philippines. Uchida 1928*b*, p. 89: Misaki, Japan. ?Ranson 1936*b*, p. 208: Balearics, Mediterranean. Bigelow 1940, p. 308: Pacific Ocean off Colombia. Blackburn 1955, p. 424: S.E. Australian waters. Kramp 1957*a*, pp. 78, 79, 110 ff., text-fig. 14, map: comparison with *S. incisa*; remarks on morphology; Somali, E. Africa; S.E. of Africa; Cape of Good Hope; Cape Verde Islands; eastern Atlantic; Brazil. Kramp 1959*a*, pp. 71, 202, 242, 246, 249, 253, 256, 260, fig. 315: Bay of Biscay; off west coast of Africa; N.E. of Brazil; diagnosis; distribution. Kramp 1959*b*, p. 15: Angola, West Africa.

Solmissus sp.

Ganapati & Nagabhushanam 1958, pp. 93, 94: *Solmissus* sp.; Vizagapatam coast, India.

Order ACTINULIDA

Free-living, solitary hydrozoa, retaining in their adult stage the bipolar organization of an actinula, and with direct development.

Family *HALAMMOHYDRIDAE*

Free-living, very small hydrozoa, completely covered with cilia; with an aboral adhesive organ; with sexual organs in the walls of the stomach; with solid tentacles; with endodermal statocysts.

Genus ***Halammohydra*** Remane 1927

Halammohydridae with elongated stomach terminating in a simple mouth-opening; with a tiny apical knob carrying two whorls of very long contractile tentacles and one whorl of statocysts. Demersal habitat.

Type-species: *H. octopodides* Remane.

REMANE 1927, pp. 643–77: *Halammohydra* n.g. LELOUP 1935*b*, pp. 1–4: discussion of systematic position. WEILL 1935*a*, pp. 73–87, text-figs. 1–5: systematic position. SWEDMARK & TEISSIER, 1956*b*, pp. 183–9: development, variation, ecology. SWEDMARK & TEISSIER 1957*a*, p. 47: diagnosis. SWEDMARK & TEISSIER 1958*a*: to new order of Hydrozoa: Actinulida.

Halammohydra adherens Swedmark & Teissier 1958

SWEDMARK & TEISSIER 1958*a*, p. 1: preliminary note; Roscoff, France.

Halammohydra octopodides Remane 1927

Body up to 0·4 mm long; up to 14 tentacles and seven statocysts; tentacles without a basal thickening.

REMANE 1927, pp. 643–77, text-figs. 1–3, 6–9, 14–21: *Halammohydra octopodides* n.g., n.sp.; Bay of Kiel, Baltic; Heligoland, North Sea. KRAMP 1937*b*, p. 133, text-fig. 60. TEISSIER 1950*a*, p. 9: Roscoff, France. TEISSIER 1950*b*, p. 29: Roscoff, France. DAHL 1952, pp. 112–13: Kattegat, Sweden. SWEDMARK 1956*a*, p. 92: Marseilles, Mediterranean. SWEDMARK 1956*b*, p. 183 ff. SWEDMARK & TEISSIER 1957*a*, pp. 38 ff., text-fig. 5, Pl. 2: comparison with *H. vermiformis*; p. 48: diagnosis. SWEDMARK & TEISSIER 1957*b*, pp. 501–4. SWEDMARK & TEISSIER 1958*a*, p. 1. KRAMP 1959*a*, p. 203, fig. 317: diagnosis.

Halammohydra schulzei Remane 1927

Body up to 0·8 mm long; about 20 tentacles and more than 10 statocysts; each tentacle of one of the two whorls with a large basal thickening.

REMANE 1927, pp. 643–77, text-figs. 4, 5, 10–13: *Halammohydra schulzei* n.sp.; Heligoland, North Sea. KRAMP 1937*b*, p. 133. SWEDMARK & TEISSIER 1950, pp. 173, 174: development; Roscoff, France. TEISSIER 1950*a*, p. 9: Roscoff, France. TEISSIER 1950*b*, p. 29: Roscoff, France. SCHULZ 1952, pp. 6, 7: western Baltic. WILKE 1953, pp. 211–15: Gulf of Naples. SWEDMARK 1956*a*, p. 70–95: Marseilles. SWEDMARK 1956*b*, pp. 183 ff. SWEDMARK & TEISSIER 1957*a*, pp. 38 ff., text-fig. 5, Pl. 2: comparison with *H. vermiformis*; p. 47: diagnosis. SWEDMARK & TEISSIER 1957*b*, pp. 501–4, text-figs. 1, 3, 4, 7: development; comparison with *H. octopodides* and *vermiformis*. SWEDMARK & TEISSIER 1958*a*, p. 1. KRAMP 1959*a*, p. 203: diagnosis.

Halammohydra vermiformis Swedmark & Teissier 1957

Body 1·3 mm long; with three or four tentacles in the most aboral whorl; the other whorl with four tentacles, one of which is much longer than the others; tentacles without a basal thickening; normally four (rarely three) statocysts.

SWEDMARK 1956*b*, pp. 183 ff. SWEDMARK & TEISSIER 1957*a*, pp. 38 ff., text-fig. 5, Pl. 1: *Halammohydra vermiformis* n.sp.; comparison with *H. octopodides* and *schulzei*; Roscoff, France; p. 48: diagnosis. SWEDMARK & TEISSIER 1957*b*, pp. 501–4, text-figs. 2, 5–6. SWEDMARK & TEISSIER 1958*a*, p. 1. KRAMP 1959*a*, p. 203: diagnosis.

Family *OTOHYDRIDAE*

Free-living, very small hydrozoa, completely covered with cilia; without aboral adhesive organ; with sexual organs in the walls of the stomach; with solid tentacles; with endodermal statocysts.

Genus ***Otohydra*** Swedmark & Teissier 1958

Otohydridae with ovoid body; with only one whorl of tentacles and one whorl of statocysts. Demersal habitat.

Type species: *O. vagans* Swedmark & Teissier.

SWEDMARK & TEISSIER 1958*a*, p. 2: preliminary note. SWEDMARK & TEISSIER 1958*c*, pp. 238–40.

Otohydra vagans Swedmark & Teissier 1958

Body up to 0·35 mm long, ovoid, with up to 24, usually 12–16, tentacles, simple, short, up to 0·5 mm when fully extended; 8–12 statocysts; in shell gravel, at depths 40–60 m.

SWEDMARK & TEISSIER 1958*a*, p. 2: preliminary note. SWEDMARK & TEISSIER 1958*c*, pp. 238–40, fig. 1: *Otohydra vagans* n.g., n.sp.; north coast of Finisterre, France.

Order PTEROMEDUSAE

Trachyline medusae whose body is divisible into aboral and oral halves, separated by a line of tissue lying in the bottom of a constriction, this tissue representing the margin of the umbrella which is divided into four flaps acting as swimming lappets; the subumbrellar part of the body is highly reduced and consists of only the manubrium and the tissues on the adoral surfaces of the lappets. Without tentacles, but with statocysts on the oral sides of the lappets; statoliths endodermal. Gonads of ectodermal origin; development direct.

Tetraplatia Busch 1851*

Pelagic Pteromedusae of elongate, bipyramidal form with ciliated outer surface; with four gonads, each with an oral and an aboral bilobed portion; with four bilobed swimming lappets, each lobe with a statocyst.

BUSCH 1851, pp. 104–20: *Tetraplatia* n.g.; to the order Pteromedusae.

Tetraplatia chuni Carlgren 1909

Body up to about 13 mm long; without flying buttresses joining the oral and aboral portions of the body.

CARLGREN 1909, pp. 79–93, 104–22, Pl. 19, figs. 10–14, Pls. 11, 12, 13, figs. 1–5, text-figs. 1, 2: *Tetraplatia chuni* n.sp.: west of Cape of Good Hope. HAND 1955, pp. 331–48: discussion. REES & WHITE 1957*b*, pp. 101–4, Pl. 3, figs. 1–3: South Atlantic (new records). RALPH 1959, pp. 369–79, fig. 1 A, B, fig. 2 (diagram).

Tetraplatia volitans Busch 1851

Body up to about 9·5 mm long; oral portion in small specimens about as long as the aboral portion, in large specimens twice as long; with four flying buttresses, joining the basal corners of the oral and aboral portions of the body.

BUSCH 1851, pp. 120, 121, Pl. 10, figs. 3, 4: *Tetraplatia volitans* n.g., n.sp.; Mediterranean. CLAUS 1878, pp. 349–59, Pl. 22: as *Tetrapteron* (*Tetraplatia*) *volitans*. HAECKEL 1880, p. 655. CARLGREN 1909, pp. 93–103, Pl. 10, figs. 1–9, Pl. 13, figs. 6–15: description, survey of distribution, discussion; tropical Indian Ocean (new record). DANTAN 1925, pp. 429–59, Pl. 1, figs. 1–9, Pl. 2, figs. 1–5, text-fig. 12: description and discussion; Algeria, N. Africa. ROSE 1926, p. 59. DANTAN 1927, two figs. LELOUP 1935*a*, pp. 1–7, map; eastern tropical Atlantic and off Rio de Janeiro, Brazil. KOMAI 1939, pp. 231–46, Pl. 31, text-figs. 1–11: description and discussion; Japan. UCHIDA 1954, pp. 209–19: Japan. BEYER 1955*b*, pp. 106–12, text-figs. 1, 2, map of distribution: off southern coast of Chile. HAND 1955, pp. 332–48, text-figs. 1–8: structure and distribution; off Pacific coast of North and

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* See Addenda, p. 445.

Central America. Rees & White 1957*a*, pp. 129–40, text-figs. 1–7: N.W. of Scotland; Bay of Biscay; west of Spain; equatorial and southern Atlantic; southern Pacific. Rees & White 1957*b*, pp. 101–4, Pl. 3, fig. 4: comparison with *T. chuni*. Ralph 1959*a*, pp. 369–79.

HYDROZOA INCERTAE SEDIS

Family *ARMORHYDRIDAE*

Hydrozoa with ovoid body consisting of a voluminous gastral portion enclosed in a delicate umbrella without radial canals, but with a velum pierced by a narrow central opening; umbrella margin with a whorl of tentacles of two kinds, partly filiform, partly cylindrical with a terminal adhesive pad; no sense organs; sexual organs in the gastral portion of the body. Systematic position doubtful.

Genus ***Armorhydra*** Swedmark & Teissier 1958

With the characters of the family.

Armorhydra janowiczi Swedmark & Teissier 1958

Body 1·5–2 mm long when at rest, 4 mm when extended; with up to 30 tentacles when adult.

Swedmark & Teissier 1958*b*, pp. 133–5, fig. 1 A, B, C: *Armorhydra janowiczi* n.g., n.sp.; Roscoff, France.

Order STAUROMEDUSAE

Scyphozoa developing directly from the scyphistoma, consisting of a calyx and a more or less distinct aboral peduncle attached to substratum by an adhesive disk; typically with adradial marginal lobes (arms) carrying hollow, terminally knobbed tentacles.

Family *ELEUTHEROCARPIDAE*

Stauromedusae with four simple, perradial stomach pouches.

Subfamily *LUCERNARIINAE*

Eleutherocarpidae with faintly or well developed marginal lobes; with eight adradial clusters of hollow, terminally knobbed tentacles; peduncle single-chambered or with four perradial chambers, with muscles in the septa. Coronal muscle unbroken or divided into eight separate sectors.

Genus ***Haliclystus*** Clark 1863

Lucernariinae with eight perradial and interradial marginal anchors; peduncle with four perradial chambers; calyx with eight well developed marginal lobes (arms), about equidistant; coronal muscle divided into eight separate sectors.

Type-species: *H. auricula* (Rathke).

CLARK 1863, p. 559: *Haliclystus* n.g. HAECKEL 1880, p. 387. MAYER 1910, p. 531.

Haliclystus antarcticus Pfeffer 1889

Calyx conical, flat, up to about 28 mm wide; peduncle 1/2 – 2/3 as long as height of calyx; arms fairly short, flat, equidistant, each with up to 100 or more tentacles; marginal anchors very large, biscuit-shaped, each with a tentacular knob; gonads wide, lancet-shaped, widely separated, extending to ends of arms, with 100–150 follicles in 6–8 radiating rows.

PFEFFER 1889, p. 16: *Haliclystus antarcticus* n.sp.; South Georgia, Antarctic. MAYER 1910, p. 536. THIEL 1928, p. 22. CARLGREN 1930, p. 1, figs. 1–9: Antarctic.

Haliclystus auricula (Rathke 1806)

Calyx conical to pyramidal, up to about 30 mm wide, about as high as wide or somewhat lower; peduncle about as long as height of calyx; perradial notches between arms slightly deeper than the interradial: 30–60 (up to 100) tentacles on each arm; marginal anchors kidney-shaped, with a short, cylindrical stalk; gonads to ends of arms, with follicles in 2–4 or six radial rows; subumbrella smooth.

Rathke 1806, p. 35: as *Lucernaria auricula* n.sp. Lamarck 1816, p. 474: as *L. octoradiata* n.sp. Clark 1863, pp. 559, 565: *Haliclystus auricula* and *octoradiatus* n.g. Haeckel 1880, pp. 388, 389: *H. auricula* and *octoradiatus.* Kishinouye 1910, p. 4, Pl. 1, fig. 3: as *H. tenuis* n.sp.; Japan. Mayer 1910, p. 532, text-fig. 339: *H. auricula* (? = *H. tenuis* Kishinouye); (North Atlantic, coasts of Europe, North America and Alaska); p. 534: as *H. octoradiatus*; (Northern Europe; Greenland; Spitzbergen). Bigelow 1914*b*, p. 25: New England, east coast of U.S.A. Kramp 1914, p. 442: as *H. octoradiatus*; W. Greenland. Evans 1916, p. 283: Firth of Forth, Scotland. Pérèz 1921*a*, pp. 82–5, figs. 2–4: Boulonnais, France. Elmhirst 1922, p. 224: as *H. octoradiatus*; Scotland. Migot 1922, pp. 827–9, fig. 1: as *H. octoradiatus*; Roscoff, France. McIntosh 1926, p. 258: Scotland. Weill 1926*a*, p. 259: as *H. octoradiatus*; nematocysts. Uchida 1927*b*, p. 226, fig. 3: *H. tenuis* Kishinouye 1910 = *H. auricula*; Japan. Thiel 1928, p. 23: *H. auricula* (= *H. tenuis*); E. Spitzbergen; p. 24: as *H. octoradiatus*; western Baltic; Scilly Islands, English Channel. Uchida 1929*b*, p. 113, Pl. 3, figs. 4, 6, text-figs. 9–27: Japan; p. 120: *H. tenuis* = *auricula.* Mar. Biol. Ass. 1931, p. 85: Plymouth, England. Nobre 1931, p. 25: Portugal. Child 1933, pp. 75–106, text-figs. 1–29, tab. I-III: reconstitution; Japan. Hanaoka 1934, pp. 117–20: as *H. octoradiatus*; early development. Weill 1934*b*, p. 533, figs.: as *H. octoradiatus.* Carlgren 1935, pp. 5, 18, fig. 5: as *H. octoradiatus.* Kramp 1937*b*, p. 166, fig. 72: as *H. octoradiatus*; Denmark. Uchida 1938*b*, p. 44: Japan. Uchida 1938*c*, p. 54: Japan. Kramp 1939*a*, p. 19: as *H. octoradiatus*; Iceland. Hyman 1940, p. 292, fig. 8: as *H. sanjuanensis*; experiments; San Juan Island, Puget Sound, W. coast of N. America. Ling 1940, p. 286: Chefoo, China. Kramp 1942, p. 104: as *H. octoradiatus*; W. Greenland. Ranson 1945*b*, p. 313: *H. auricula*; Canada; as *H. octoradiatus*; France. Kramp 1947, p. 49: as *H. octoradiatus*; Faroes. Leloup 1947, p. 44: as *H. octoradiatus*; coast of Belgium. Yashnov 1948, p. 77, Pl. 22, figs. 7*a*, *b*: as *H. octoradiatus*; White Sea. Berrill 1949*a*, p. 283: development. Kramp 1952, p. 10: Chile. Southward 1954, p. 20: Irish Sea. Uchida 1954, pp. 209–19: Japan. Bassindale & Barret 1957, p. 247: Dale Fort, Wales. Thiel 1958*b*, p. 46.

Haliclystus borealis Uchida 1933

Calyx quadro-pyramidal, evenly narrowing aborally, up to about 8 mm wide, somewhat higher than wide; peduncle less than 1/3 as long as height of calyx; arms short, perradial notches slightly wider than the interradial; 20–30 tentacles on each arm; marginal anchors with a short stalk and a round cushion-like disk with a longitudinal central furrow, without a pigment fleck; gonads broad, lancet-shaped, extending to ends of arms, interradially connected along their proximal halves, with about 50 follicles in 3–4 rows in their widest portions; subumbrella smooth. Four white interradial stripes from anchors to base of calyx.

Uchida 1933*b*, pp. 450–2, fig. 1: *Haliclystus borealis* n.sp.; Japan. Uchida & Hanaoka 1934, pp. 212ff, figs. 1–16: Japan. Uchida 1940*a*, p. 293: Japan. Uchida 1954, pp. 209–19: Japan.

Haliclystus kerguelensis Vanhöffen 1908

Calyx conical, flat, up to 27 mm wide; peduncle about twice as long as height of calyx; arms fairly short, equidistant, each with no more than 50 tentacles; marginal anchors small, oval, each with a tentacular knob; gonads wide, lancet-shaped, widely separated, extending to ends of arms.

VANHÖFFEN 1908*b*, p. 31, Pl. 2, fig. 1: *Haliclystus kerguelensis* n.sp.; Kerguelen Island, Antarctic Sea. MAYER 1910, p. 536, text-fig. 341. THIEL 1928, p. 22: comparison with *H. antarcticus*. KRAMP 1957*b*, pp. 160, 162: Kerguelen Island, new record.

Haliclystus salpinx Clark 1863

Calyx pyramidal, octangular, much broader than high, up to 30 mm wide; peduncle considerably longer than height of calyx; notches between arms of equal width; 60–70 tentacles on each arm; marginal anchors very large, obliquely trumpet-shaped, each with a rudimentary tentacle; gonads projecting about half-way into the arms, with follicles in four radiating rows.

CLARK 1863, p. 563: *Haliclystus salpinx* n.sp.; Maine, U.S.A. MAYER 1910, p. 535, Pl. 56, figs. 1–4. BIGELOW 1914*b*, p. 26: New England, east coast of U.S.A. ?JOSEPH 1935, p. 78, figs. 1–7: as *Lucernaria salpinx*, determination doubtful; Trieste, Adriatic Sea. RANSON 1945*b*, p. 313: Anticosti, Canada.

Haliclystus steinegeri Kishinouye 1899

Calyx conical, funnel-shaped, up to 18 mm wide, about 2/3 as high as wide; peduncle somewhat shorter than height of calyx; arms equidistant, notches between them comparatively shallow; 70–100 tentacles on each arm; marginal anchors fairly large, egg-shaped, each with a short stalk and a small protuberance at the oral portion; gonads broad, extending to ends of arms, interradially connected along their proximal halves, with 90–120 follicles in 3–6 irregular rows. Subumbrella radially folded, with eight adradial furrows.

KISHINOUYE 1899*a*, p. 126, figs. 1–3: *Haliclystus steinegeri* n.sp.; Bering Island and Commander Islands, North Pacific. MAYER 1910, p. 535, text-fig. 340. BIGELOW 1920, p. 12, Pl. 2, fig. 4: Alaska. UCHIDA 1929*b*, p. 125, figs. 28–34: N. Saghalin; Japan. UCHIDA & HANAOKA 1934, pp. 224ff, figs. 17–27: Japan. LING 1939, p. 287, figs. 7–14: Chefoo, China. UCHIDA 1940*a*, p. 293: Japan. UCHIDA 1954, pp. 209–19, map: Japan.

Genus ***Lucernaria*** O. F. Müller 1776

Lucernariinae without perradial and interradial marginal anchors or papillae; peduncle single-chambered; calyx with eight well developed marginal lobes; coronal muscle divided into eight separate sectors; with eight gonads in four interradial pairs.

Type-species: *L. quadricornis* O. F. Müller.

O. F. MÜLLER 1776, p. 227: *Lucernaria* n.g. HAECKEL 1880, p. 389. HAECKEL 1881, p. 53: *Lucernaria*; p. 62: as *Lucernosa* n.g. MAYER 1910, p. 526.

Lucernaria australis Vanhöffen 1908

Calyx thimble-shaped, with sloping sides, up to 9 mm wide and slightly more in height; peduncle almost rudimentary; perradial notches between arms somewhat wider and deeper than the interradial; arms short, each with up to 100 short tentacles; gonads very broad, extending to base of arms.

VANHÖFFEN 1908*b*, p. 32, figs. 1, 2: *Lucernaria australis* n.sp.; Gauss Station, Antarctic. MAYER 1910, p. 530. non THIEL 1928, p. 19: Karajakfjord, W. Greenland. CARLGREN 1930, p. 7, figs. 10–17: Antarctic.

Lucernaria bathyphila Haeckel 1880

Calyx up to 60 mm wide, slightly higher than wide; peduncle short, 5–10 mm in length; perradial notches between arms only a little wider and deeper than the interradial; arms very short, each with 80–120 tentacles; gonads broad and short, not extending to ends of arms.

HAECKEL 1880, p. 640: *Lucernaria bathyphila* n.sp.; between Faroe and Shetland Islands, northern Atlantic. MAYER 1910, pp. 527, 530, text-fig. 337. STIASNY 1931*a*, p. 139.

Lucernaria haeckeli (Antipa 1892)

Calyx oval, goblet-shaped, widest near middle, 27 mm wide and 60–65 mm high; peduncle conical, wide, hardly 1/3 as long as calyx; perradial notches between arms only a little wider than the interradial; arms short, each with 80–90 tentacles; gonads very wide, overlapping, extending not quite to base of arms.

ANTIPA 1892, p. 388, Pl. 18, figs. 12–14: *Lucernosa haeckeli* n.sp.; East Spitzbergen. MAYER 1910, p. 529: *Lucernaria haeckeli*. KRAMP 1914, p. 442: as *L. campanulata*; W. Greenland. THIEL 1928, p. 21: examination of original specimen. KRAMP 1942, p. 105: W. Greenland. KRAMP 1943, p. 11: E. Greenland.

Lucernaria infundibulum Haeckel 1880

Calyx funnel-shaped, flat, 24 mm wide and about half as high; peduncle 7 mm long; perradial notches between arms only a little wider and deeper than the interradial; arms short, each with 60–80 tentacles; gonads extending to base of arms.

HAECKEL 1880, pp. 385, 392: *Lucernaria infundibulum* n.sp.; Spitzbergen. MAYER 1910, p. 529.

Lucernaria quadricornis O. F. Müller 1776

Calyx funnel-shaped, up to 60 mm wide and about half as high; peduncle somewhat longer than height of calyx; perradial notches between arms twice as wide and deep as the interradial; 100–140 tentacles on each arm; gonads extending almost to ends of arms.

O. F. Müller 1776, p. 227: *Lucernaria quadricornis* n.g., n.sp.; Denmark. Haeckel 1880, p. 390: *L. quadricornis*; p. 391, Pl. 22, 10 figs.: as *L. pyramidalis* n.sp.; coast of Labrador. Mayer 1910, p. 527: *L. quadricornis*; (northern coasts of Europe; Greenland); coast of America N. of Cape Cod; p. 528, text-fig. 336: as *L. pyramidalis* Haeckel, possibly identical with *L. quadricornis*. Kramp 1913*a*, p. 277: W. Greenland. Bigelow 1914*b*, p. 26: New England, east coast of U.S.A. Kramp 1914, p. 441: E. and W. Greenland. ?Elmhirst 1922, pp. 221–4: discussion; Isle of Man, Irish Sea. Thiel 1928, p. 17: western Baltic. Kramp 1933*b*, p. 16: Kangerdlugssuak, E. Greenland. Carlgren 1935, fig. 9. Kramp 1937*b*, p. 165, fig. 71: Denmark. Kramp 1942, p. 105: W. Greenland. Kramp 1943, p. 10: E. Greenland. Ranson 1945*b*, p. 313: Novaja Zemlja; Barents Sea. Kramp 1947, p. 49: Faroes; Norway. Yashnov 1948, p. 76, Pl. 22, fig. 5: Barents Sea and White Sea. Bassindale & Barret 1957, p. 247: Dale Fort, Wales.

Lucernaria saint-hilarei (Radicorzew)

Calyx up to 85 mm wide and 90 mm high; peduncle about half as long as height of calyx; perradial notches between arms about twice as wide and deep as the interradial; each arm with 150–200 tentacles; gonads very broad, with numerous (about 300) separate, sac-like pouches; body transparent, with pink gonads and violet tentacles.

Yashnov 1948, p. 76, Pl. 22, fig. 6: as *Lucernosa saint-hilarei* Radicorzew; White Sea.

Lucernaria walteri (Antipa 1892)

Calyx goblet-shaped, up to 60 mm wide, somewhat higher than wide; peduncle as long or somewhat longer than height of calyx; perradial notches between arms twice or three times as wide and deep as the interradial; each arm with a ball-like cluster of 700–850 short tentacles; gonads lancet-shaped, extending to ends of arms.

Antipa 1892, p. 379, Pl. 17, figs. 1–9: as *Lucernosa walteri* n.sp.; E. Spitzbergen; p. 386, Pl. 18, figs. 10, 11: as *Lucernosa kükenthali* n.sp.; E. Spitzbergen. Mayer 1910, p. 529: *Lucernaria walteri* and *kükenthali*. Thiel 1928, p. 20: *L. walteri* (=*kükenthali*); examination of original specimens.

Genus ***Stenoscyphus*** Kishinouye 1902

Lucernariinae with eight perradial and interradial marginal anchors; peduncle with four perradial chambers; calyx with simple, uncleft margin without adradial lobes; coronal muscle ring-shaped, entire.

Type-species: *S. inabai* Kishinouye.

Kishinouye 1902, p. 2: *Stenoscyphus* n.g. Mayer 1910, p. 524.

Stenoscyphus inabai (Kishinouye 1893)

10–15 (up to 25) mm high, narrow, funnel-shaped, bell-margin quadratic, with eight clusters of secondary tentacles arranged in four interradial pairs, each with up to 25 tentacles; eight gonads, band-shaped, in four interradial pairs.

KISHINOUYE 1893, p. 416: as *Depastrum inabai* n.sp.; Japan. KISHINOUYE 1902, p. 2, Pl. 1, figs. 1, 2: *Stenoscyphus inabai* n.g., Japan. MAYER 1910, p. 525, text-fig. 334. UCHIDA 1929*b*, p. 107, Pl. 3, figs. 1, 2, text-figs. 1–8: Japan. UCHIDA & HANAOKA 1934, p. 236, map: Japan. UCHIDA 1938*a*, p. 147: Japan. UCHIDA 1938*b*, p. 44: Japan. LING 1939, p. 282, figs. 1–4: Little Tsingtao, China. UCHIDA 1954, pp. 209–19: Japan.

Subfamily *KISHINOUYEINAE*

Eleutherocarpidae with well developed marginal lobes; with eight adradial clusters of hollow, terminally knobbed tentacles; peduncle single-chambered, or four-chambered in lower portion, without muscles; coronal ring muscle discontinuous in each adradius.

Genus ***Kishinouyea*** Mayer 1910

Kishinouyeinae without perradial and interradial marginal anchors or papillae; peduncle four-chambered in lower portion.

Type-species: *K. nagatensis* (Oka).

KISHINOUYE 1902, p. 5: *Schizodiscus* n.g. MAYER 1910, p. 531: *Kishinouyea* nom. nov. for *Schizodiscus*, which is preoccupied.

Kishinouyea nagatensis (Oka 1897)

The eight adradial lobes united in pairs, the four perradial notches about twice as deep as the four interradial.

OKA 1897, p. 67, Pl. 1: as *Lucernaria nagatensis* n.sp.; Japan. KISHINOUYE 1902, p. 6, Pl. 1, figs. 3–6: as *Schizodiscus nagatensis.* MAYER 1910, p. 531, text-fig. 338: *Kishinouyea nagatensis* nom. nov. UCHIDA 1929*b*, p. 137, figs. 43–5: Japan. UCHIDA & HANAOKA 1934, p. 236, map: Japan. UCHIDA 1938*a*, p. 148, fig.: Japan. LING 1939, p. 496, figs. 15–21: East Saddle, China. UCHIDA 1954, pp. 209–19: Japan.

Genus ***Lucernariopsis*** Uchida 1929

Kishinouyeinae without perradial and interradial marginal anchors of papillae (rarely papillae in young stages); peduncle single-chambered.

Type-species: *L. campanulata* (Lamouroux).

LAMOUROUX 1815, p. 472: as *Lucernaria.* MAYER 1910, p. 530: as *Lucernaria.* UCHIDA 1929*b*, p. 154: *Lucernariopsis* n.g.

Lucernariopsis campanulata (Lamouroux 1815)

20–30 mm wide, 30–40 mm high, including the peduncle; calyx funnel-shaped, about as wide as high, eight marginal lobes equidistant, with equally developed notches between them; 30–40 tentacles in each of the adradial clusters; peduncle somewhat shorter than calyx.

LAMOUROUX 1815, p. 472, Pl. 16, figs. 1–7: as *Lucernaria campanulata* n.sp. MAYER 1910, p. 530: as *Lucernaria campanulata*; (from Black Sea and Mediterranean to southern England). ?STIASNY 1919*b*, p. 69: as *Lucernaria campanulata*; Heligoland, North Sea. THIEL 1928, p. 18: as *Lucernaria campanulata*; Scilly Islands, English Channel. UCHIDA 1929*b*, p. 154: *Lucernariopsis campanulata* n.g. CARLGREN 1930, p. 18: confirms the new genus. MAR. BIOL. ASS. 1931, p. 85: as *Lucernaria campanulata*; Plymouth. NOBRE 1931, p. 25: as *Lucernaria campanulata*; Portugal. HANAOKA 1934, p. 117: as *Lucernaria campanulata*. WEILL 1934*b*, p. 534, figs.: as *Lucernaria campanulata*. JOSEPH 1935, p. 78: as *Lucernaria campanulata*; Adriatic Sea. WEILL 1935*b*, p. 774: as *Lucernaria campanulata*. EALES 1938, pp. 167–70, three figs.: as *Lucernaria discoidea* n.sp.; Channel Islands, S. of England. ?RANSON 1945*b*, p. 313: as *Lucernaria campanulata*; Heligoland; North Sea; France. BASSINDALE & BARRET 1957, p. 247: Dale Fort, Wales. VALKANOV 1957, p. 17: as *Lucernaria campanulata*; Black Sea.

Lucernariopsis vanhoeffeni (Browne 1910)

Differs from *L. campanulata* in the absence of a true peduncle; only a narrow constriction separates the calyx from the adhesive disk, which is very broad and flat.

BROWNE 1910, p. 40, Pl. 5, figs. 3–6, Pl. 7, figs. 3, 4: as *Lucernaria vanhöffeni* n.sp.; Cape Adare, Antarctic. UCHIDA 1929*b*, p. 154: *Lucernariopsis vanhöffeni*, n.g. CARLGREN 1930, p. 14, figs. 18–24. STIASNY 1931*a*, p. 139: as *Lucernaria vanhöffeni*; Cape Adare, Antarctic.

Lucernariopsis sp. Panikkar 1944

PANIKKAR 1944, p. 238: *Lucernariopsis* sp.; Krusadai Island, Gulf of Manaar, India. An undetermined species, referred to *Lucernariopsis*.

Genus ***Sasakiella*** Okubo 1917

Kishinouyeinae with perradial and interradial primary tentacles terminally knobbed and not metamorphosed into anchors; peduncle four-chambered in lower portion; coronal muscle divided into eight.

Type-species: *S. cruciformis* Okubo.

OKUBO 1917, pp. 317–22: *Sasakiella* n.g.

Sasakiella cruciformis Okubo 1917

Calyx cruciform, about 10 mm wide, with four interradial arms, each subdivided at the tip into two, with 10–15 (up to 25) knobbed tentacles in each of the eight clusters of secondary tentacles; gonads in eight adradial rows.

OKUBO 1917, p. 317, figs. 1, 2: *Sasakiella cruciformis* n.g., n.sp.; Japan. UCHIDA 1927*b*, p. 228, fig. 4: Japan. UCHIDA 1928*a*, pp. 375, 376, fig. 2: Japan. UCHIDA 1929*b*, p. 140, Pl. 3, figs. 3, 5, Pls. 4, 5, text-figs. 46–58: Japan. UCHIDA & HANAOKA 1934, p. 236, map: Japan. LING 1937, p. 16: Tsingtao, China. UCHIDA 1938*b*, p. 44: Japan. UCHIDA 1938*c*, p. 54, figs. 5, 6: Japan. LING 1939, p. 500: Chefoo, China. UCHIDA 1954, pp. 209–19: Japan.

Sasakiella tsingtaoensis Ling 1937

With primary tentacles in the perradii only; the four arms narrower at base than in *S. cruciformis.*

LING 1937, p. 25: *Sasakiella tsingtaoensis* n.sp.; Tsingtao, China. UCHIDA 1938*c*, p. 54, figs. 5, 6: determination uncertain; Japan. UCHIDA 1954, pp. 209–19: Japan.

Subfamily *LIPKEINAE*

Eleutherocarpidae with reduced tentacles; peduncle single-chambered, with muscles; coronal muscle unbroken.

Genus ***Lipkea*** Vogt 1886

Lipkeinae without perradial and interradial marginal anchors or papillae.

Type-species: *L. ruspoliana* Vogt.

VOGT 1886, p. 356: *Lipkea* n.g. ANTIPA 1893, p. 628: as *Capria* n.g. MAYER 1910, p. 539: as *Capria* and *Lipkea.* CARLGREN 1933*b*, p. 3: *Capria* synonym of *Lipkea.*

Lipkea ruspoliana Vogt 1886

Calyx flat, 7–8 mm wide, 4 mm high, peduncle only 1·5 mm long, very broad, 4 mm; eight marginal lappets, short, blunt, evenly rounded, with 15–20 large, oval mucous glands on their inner side, but without true tentacles.

VOGT 1886, p. 356; 1887, pp. 1–53, Pls. 10, 11, figs. 1–17: *Lipkea ruspoliana* n.g., n.sp.; Sardinia, Mediterranean. MAYER 1910, p. 540. UCHIDA 1929*b*, p. 149, fig. 59, p. 154: to family Lipkeidae. CARLGREN 1933*b*, pp. 3 ff.: discussion.

Lipkea stephensoni Carlgren 1933

About 16 mm high and half as wide, elongated, peduncle very short and broad; eight adradial lobes short, but distinct, with 30–40 much reduced tentacles in one row along their margin.

CARLGREN 1933*b*, p. 15, figs. 1–14: *Lipkea stephensoni* n.sp.; South Africa.

Lipkea sturdzi (Antipa 1893)

9 mm high and 5·5–6 mm wide, globular, peduncle broad, about as long as calyx; 8 (–10) adradial marginal lobes, short, paddle-like, each with 16–20 rudimentary tentacles fused one to another by a web.

ANTIPA 1893, p. 618, Pl. 40, figs. 1–18: as *Capria sturdzi* n.g., n.sp.; Island of Capri, Italy. MAYER 1910, p. 539: as *Capria sturdzi*. UCHIDA 1929*b*, p. 154: as *Capria sturdzi*. CARLGREN 1933*b*, p. 3: *Lipkea sturdzi*.

Family *CLEISTOCARPIDAE*

Stauromedusae in which the gonads are united by a transverse, circumferential membrane (claustrum) which divides each of the four perradial stomach pouches into an outer and an inner space.

Subfamily *DEPASTRINAE*

Cleistocarpidae without, or with faintly indicated marginal lobes; adradial tentacles terminally knobbed, arranged in one or more rows around the bell margin; perradial and interradial tentacles similar to adradial or papilliform; peduncle four-chambered, with muscles.

Genus ***Depastromorpha*** Carlgren 1935

Depastrinae with glandular cushions surrounding bases of the eight primary tentacles and some of the tentacles in the adradial groups; with unbroken coronal muscle inside the primary tentacles.

Type-species: *D. africana* Carlgren.

CARLGREN 1935, p. 14: *Depastromorpha* n.g.

Depastromorpha africana Carlgren 1935

Urn-shaped, about 10 mm in height, peduncle very short, contractile; bell margin faintly lobate; the eight primary and some of the secondary, adradial tentacles partly metamorphosed, with glandular cushions; about 25 tentacles in each adradial group.

CARLGREN 1935, pp. 1–24, figs. 1–4, 6–8, 10–12: *Depastromorpha africana* n.g., n.sp.; Capetown, South Africa.

Genus ***Depastrum*** Gosse 1858

Depastrinae without glandular cushions around tentacles; with unbroken coronal muscle outside the primary tentacles.

Type-species: *D. cyathiforme* (M. Sars).

Gosse 1858, p. 419: *Depastrum* n.g. Haeckel 1880, pp. 376, 378: *Depastrum* and *Depastrella* n.g. Mayer 1910, p. 523.

Depastrum cyathiforme (M. Sars 1846)

Urn-shaped, about 6–10 mm wide and somewhat more in height; peduncle about as long as calyx, flexible, contractile; bell margin sinuous; 1–3 primary tentacles in each perradius and interradius, about nine tentacles in each of the eight adradial groups.

M. Sars 1846, p. 26, Pl. 3, figs. 8–13: as *Lucernaria cyathiforme* n.sp.; Norway. Gosse 1858, p. 419: *Depastrum cyathiforme* n.g.; England. Haeckel 1880, p. 378: *D. cyathiforme*; p. 376: as *Depastrella carduella* n.g., n.sp.; Canary Islands; p. 639: as *Depastrum polare* n.sp.; Spitzbergen. Mayer 1910, p. 524. ?Elmhirst 1922, p. 224: Scotland. ?Elmhirst 1923, p. 22: Clyde Sea, Scotland. Mar. Biol. Ass. 1931, p. 84: Plymouth, England. Stiasny 1931*a*, p. 139: Plymouth. Southward 1954, p. 20: Irish Sea.

Subfamily *THAUMATOSCYPHINAE*

Cleistocarpidae with adradial lobes; with adradial clusters of hollow, terminally knobbed tentacles; with perradial and interradial marginal anchors; peduncle single-chambered or divided into radial chambers; coronal muscle unbroken.

Genus ***Brochiella*** Krumbach 1925

Thaumatoscyphinae, six-radiate, with 12 rudimentary marginal lobes, not arranged in pairs; peduncle single-chambered.

Type-species: *B. hexaradiata* (Broch).

Krumbach 1925, p. 541: *Brochiella* n.g.

Brochiella hexaradiata (Broch 1907)

About 10 mm high, calyx bell-shaped, peduncle cylindrical, somewhat longer than bell; the bell margin almost uncleft, with 7–10 tentacles in each of the 12 adradial clusters; six horse-shoe-shaped gonads with their convex sides abaxial.

Broch 1907, p. 9, Pl. 2, figs. 3–6: as *Stenoscyphus* (?) *hexaradiatus* n.sp.; Fosheims Peak, Arctic Sea. Mayer 1910, p. 525, text-fig. 335: as *S.* (?) *hexaradiatus*. Krumbach 1925, p. 541: *Brochiella hexaradiatus* n.g. Uchida 1929*b*, p. 155: as ?*Thaumatoscyphus hexaradiatus*. Carlgren 1933*a*, pp. 1, 2: abstract of Carlgren 1933*b*. Carlgren 1933*b*, p. 15, figs. 15, 16: new examination of the type-specimen; *Brochiella* and *Thaumatoscyphus* are distinct.

Genus ***Halimocyathus*** Clark 1863

Thaumatoscyphinae with eight distinct lobes arranged in four interradial pairs; peduncle four-chambered or partly so.

Type-species: *H. platypus* Clark.

Clark 1863, p. 536: *Halimocyathus* n.g. Haeckel 1880, p. 393: as *Halicyathus*. Mayer 1910, p. 536.

Halimocyathus lagena (O. F. Müller 1776)

Calyx urn-shaped, much deeper than broad, with rounded base abruptly demarcated from the peduncle, 5–7 mm wide, 60–70 mm high including the peduncle; marginal lobes about as long as broad, each with 60–70 tentacles.

O. F. Müller 1776, p. 232: as *Holothuria lagena* n.sp. Haeckel 1880, p. 394: as *Halicyathus lagena* n.g.; (Greenland; Lofoten, Norway; Eastport, Maine, U.S.A.). Mayer 1910, p. 537: *Halimocyathus lagena*. Kramp 1914, p. 444: W. Greenland. Kramp 1939*a*, p. 19: Iceland. Kramp 1942, p. 102: W. Greenland. Kramp 1943, p. 9: E. Greenland. Ranson 1945*b*, p. 313: Novaja Zemlja, N. of U.S.S.R.

Halimocyathus platypus Clark 1863

Calyx deep funnel-shaped, about 6 mm wide, 10 mm high including the peduncle; marginal lobes about twice as long as broad, each with 17–20 tentacles.

Clark, 1863, p. 537: *Halimocyathus platypus* n.g., n.sp.; Massachusetts, east coast of U.S.A. Mayer 1910, p. 537. Bigelow 1914*b*, p. 26: New England, U.S.A.

Genus ***Thaumatoscyphus*** Kishinouye 1910

Thaumatoscyphinae with eight rudimentary adradial lobes arranged in four interradial pairs; peduncle four-chambered only in uppermost part, single-chambered below.

Type-species: *T. distinctus* Kishinouye.

Kishinouye 1910, p. 2: *Thaumatoscyphus* n.g. Mayer 1910, p. 727.

Thaumatoscyphus distinctus Kishinouye 1910

Calyx about 10 mm high and 8 mm wide, almost quadrate in cross section, narrowing towards base; peduncle variable in length, up to twice as long as calyx; four pairs of very short marginal lobes separated by exceedingly shallow perradial clefts; up to 26 short tentacles in each adradial cluster; eight lanceolate gonads in paired longitudinal interradial rows.

Kishinouye 1910, p. 2, Pl. 1, figs. 1, 2: *Thaumatoscyphus distinctus* n.g., n.sp.; Kurile Islands, Japan. Mayer 1910, p. 727. Uchida 1929*b*, p. 132, figs. 35–42: Japan. Carlgren 1933*a*, pp. 1, 2. Carlgren 1933*b*, pp. 15 ff.: *Thaumatoscyphus* distinct from *Brochiella*. Uchida & Hanaoka 1933, pp. 135–53, figs. 1–20: Japan. Hanaoka 1934, pp. 117–20, figs. 1–8: Japan. Uchida & Hanaoka 1934, p. 236, map: Japan. Hanaoka 1935, pp. 159–81, figs. 1–23: Japan. Uchida 1940*a*, p. 293: Japan. Uchida 1954, pp. 209–19: Japan.

Subfamily *CRATEROLOPHINAE*

Cleistocarpidae with eight adradial lobes; with eight adradial clusters of terminally knobbed tentacles; without perradial or interradial anchors or papillae; peduncle four-chambered, without muscles.

Genus ***Craterolophus*** Clark 1863

With the characters of the subfamily.

Type-species: *C. convolvulus* (Johnston).

Clark 1863, p. 539: *Craterolophus* n.g. Haeckel 1880, p. 394. Mayer 1910, p. 538: *Craterlophus* (misprint). Uchida 1929*b*, p. 138: *Craterlophus*.

Craterolophus convolvulus (Johnston 1835)

Calyx deep goblet-shaped, 15–25 mm wide, 25–30 mm high, including the short peduncle; adradial lobes short, wide, equidistant, each with 60–80 tentacles; eight gonads, paired, nearly touching proximally, feathery.

Johnston 1835, p. 59, fig. 3: as *Lucernaria convolvulus* n.sp.; Berwick Bay, Scotland. Clark 1863, p. 540: as *Craterolophus tethys* n.g., n.sp.; North Sea. Mayer 1910, p. 530: as synonym of *L. campanulata*; p. 538: as *C. tethys*. Irving 1913, pp. 355–7: as *L. campanulata*; Yorkshire coast, England. Elmhirst 1922, pp. 221–4: as *L. campanulata*; Scotland. Thiel 1928, p. 24: as *C. tethys*; North Sea (new record). Uchida 1929*b*, p. 136: as *C. tethys*, =*L. leuckarti* Taschenberg 1877. ?Ranson 1945*b*, p. 313: as *L. campanulata*; North Sea. Segrove 1952, p. 1023: as *C. tethys*; Yorkshire coast, England (new record); discussion. Mar. Biol. Ass. 1957, p. 59: Plymouth area.

Craterolophus macrocystis von Lendenfeld 1884

Calyx 12 mm high, 6 mm wide, peduncle 8 mm high; adradial lobes short, equidistant, each with about 30 tentacles; gonads as in *C. convolvulus*; distinguished from *C. convolvulus* by the longer stalk.

von Lendenfeld 1884*c*, p. 165: *Craterolophus macrocystis* n.sp.; east coast of New Zealand. Mayer 1910, p. 538.

Order CUBOMEDUSAE

Scyphomedusae with umbrella margin not cleft into lappets; with four interradial tentacles or groups of tentacles situated on gelatinous, wing-shaped or spatula-shaped structures (pedalia); with four perradial sense organs situated within niches on the sides of the bell; with four wide perradial sacs extending outwards from the central stomach into the subumbrellar cavity, incompletely separated by interradial septa; with four pairs of leaf-shaped gonads attached along the interradial septa and extending into the gastrovascular space; the opening of the bell cavity partly closed by an annular diaphragm (velarium).

Family *CARYBDEIDAE*

Cubomedusae with four simple or tripartite interradial tentacles; four stomach pouches without diverticula.

Genus ***Carybdea*** Péron & Lesueur 1809

Carybdeidae with four simple pedalia; stomach flat, without mesenteries; gastric cirri forming brush-like bundles at the interradial corners of the stomach, or (if expanded) crescentic areas extending horizontally.

Type-species: *C. marsupialis* (Linné).

PÉRON & LESUEUR 1809, p. 332: *Carybdea* n.g. HAECKEL 1880, p. 439: as *Charybdea*. MAYER 1910, p. 506. BIGELOW 1938, p. 136: revision.

Carybdea alata Reynaud 1830

60–80 mm high (var. *grandis* 230 mm high), 50 mm, or more, wide; exumbrella without warts; sensory niches enclosed by a pair of covering scales below and by one above; gastric filaments in crescentic areas extending horizontally at the corners of the stomach; tentacles simple.

REYNAUD 1830, p. 95, Pl. 33, fig. 1: *Carybdea alata* n.sp.; southern Atlantic. HAECKEL 1880, p. 440, Pl. 25, figs. 5–8: as *Charybdea pyramis* n.sp.; West Indies; p. 441: as *C. alata*; South Africa. AGASSIZ & MAYER 1902, p. 153, Pl. 6, figs. 26–31: as *Ch. grandis* n.sp.; southern Pacific. MAYER 1906, p. 1135, Pl. 1, figs. 2–2*c*: as *Ch. moseri* n.sp.; Hawaiian Islands. MAYER 1910, p. 510: as *C. alata*; p. 511: as *C. alata* var. *pyramis*; p. 511, text-fig. 329: as *C. alata* var. *grandis*; p. 512: as *C. alata* var. *moseri*. MAYER 1915*a*, p. 171: as *C. alata* var. *grandis*; Borneo; Philippines. MAYER 1917*a*, p. 189, fig. 3: as *C. alata* var. *grandis*; Borneo; Philippines. BIGELOW 1918, p. 400: *C. alata*; Providence Channel; Florida; Bahama Bank. STIASNY 1919*a*, p. 37, fig. 5: as *C. alata* var. *moseri*; Sumatra. LIGHT 1921, p. 29: as *C. alata* var.

grandis; Philippines. THIEL 1928, p. 4: as *Ch. grandis, Ch. alata* var. *grandis*; Mariana Islands, Pacific; Atlantic. MENON 1930, p. 3, Pl. 1, fig. 3: as *Ch. madraspatana* n.sp.; Madras, India. STIASNY 1931*a*, p. 139: Japan; Ceylon. BIGELOW 1938, p. 144, figs. 11–16: *C. alata, pyramis, grandis, moseri* and *madraspatana*; non *Tamoya alata* Uchida, Stiasny and Rao; Bermudas. STIASNY 1939*b*, p. 18, figs. 1–4: *Ch. alata*; Red Sea. STIASNY 1939*c*, p. 42: *Ch. alata*; mouth of Congo, W. Africa. STIASNY 1940*a*, p. 5: *Ch. alata*; tropical parts of Atlantic, Pacific and Indian oceans. RANSON 1945*b*, p. 313: *Ch. alata*; Sandwich Islands; Indochina. RANSON 1949, p. 136: *Ch. alata*; Caribbean Sea; Marquesas Islands, Pacific. CHU & CUTRESS 1954, p. 9: as *Ch. moseri*; cause of dermatitis; Hawaii.

Carybdea aurifera Mayer 1900

Young medusa, probably = *C. sivickisi* Stiasny 1926.

MAYER 1900*b*, p. 70, Pl. 25, figs. 81–3: *Charybdea aurifera* (young medusa) n.sp.; Florida. MAYER 1910, p. 510, text-fig. 328: *C. aurifera.* BIGELOW 1938, p. 139: ? = *C. sivickisi* Stiasny. HEDGPETH 1954, p. 277: Gulf of Mexico.

Carybdea marsupialis (Linné 1758)

Up to 40 mm high, 30 mm wide; exumbrella with numerous nematocyst-warts mainly around the interradii; sensory niches with covering scale above, but entry open below; gastric cirri dendritic, the filaments primarily arising from a single trunk; tentacles simple.

LINNÉ 1758, p. 660: as *Medusa marsupialis* n.sp. PÉRON & LESUEUR 1809, p. 333: *Carybdea marsupialis*, n.g. HAECKEL 1880, p. 442: as *Charybdea marsupialis* (Mediterranean) and *Ch. murrayana* n.sp.; W. Africa. CONANT 1897, p. 8, fig. 8: as *Ch. xaymacana* n.sp.; Jamaica, West Indies. MAYER 1910, p. 507, Pl. 58, figs. 1–5: *C. marsupialis*; Mediterranean Sea; p. 509, Pl. 56, figs. 5–7, Pl. 57, fig. 1: as *C. xaymacana*; Bahamas; p. 512: as *C. murrayana.* BIGELOW 1918, p. 399: as *C. marsupialis* var. *xaymacana*; between Bermudas and Bahamas. STIASNY 1919*a*, p. 34: *C. marsupialis*; p. 35, text-figs. 1–4: as *C. xaymacana*; Haïti. THIEL 1928, p. 4: *Ch. marsupialis*; Naples, Italy. STIASNY 1930*a*, p. 6: *Ch. marsupialis*; Naples, Italy. NOBRE 1931, p. 26: Portugal. THIEL 1935*a*, p. 5: *Ch. marsupialis*; poisonous effect. BIGELOW 1938, p. 139, figs. 3–10: synonyms: *C. xaymacana* and *murrayana*; Bermudas. RANSON 1945*b*, p. 313: *Ch. marsupialis*; Algier, N. Africa. ROSSI 1950, p. 28: *Ch. marsupialis*; Golfo di Rapallo, Italy. KRAMP 1955*a*, p. 308: off Sierra Leone, W. Africa; reference to Haeckel. KRAMP 1955*b*, p. 162: revision of the determination of Haeckel's specimens from Malaya and Atlantic.

Carybdea rastoni Haacke 1886

35 mm high, 25–30 mm wide; exumbrella with numerous nematocyst-warts, mainly around the interradii; sensory niches with covering scale above, but entry open below; phacellae diffuse, the filaments arising from several trunks arranged in a row; tentacles simple.

HAACKE 1886, p. 554: *Charybdea rastonii* n.sp. KISHINOUYE 1910, p. 6, Pl. 1, figs. 7–9: as *Ch. mora* n.sp.; Japan. MAYER 1910, p. 508: *C. rastonii*; (tropical Pacific; S. Australia); p. 726: = *C. mora* Kishinouye. MAYER 1915*a*, p. 170: Philippines.

Mayer 1917*a*, p. 187, fig. 2: Philippines. Yatsu 1917, pp. 1–12, figs. 1–5: Misaki, Japan. Stiasny 1922*e*, p. 515: *Ch. rastonii*; Philippines; La Jolla. Okada 1927*a*, pp. 241–9, figs. 1–3: development; Japan. Uchida 1927*b*, p. 226: *Ch. rastonii*; Japan. Uchida 1928*a*, p. 376: *Ch. rastonii*; size. Uchida 1929*b*, p. 157, Pl. 3, fig. 7, text-figs. 60–80: Japan. Stiasny 1931*a*, p. 139: *Ch. rastonii*; Japan. Stiasny 1935, p. 10: Malayan Archipelago. Ishida 1936, pp. 449–52: on digestion; Japan. Stiasny 1937*b*, p. 204: Malay Archipelago. Bigelow 1938, pp. 136–9. Uchida 1938*a*, p. 148: *Ch. rastonii*; Japan. Uchida 1938*b*, p. 43: Japan. Uchida 1938*c*, p. 57: Japan. Uchida 1947*b*, p. 341: *Ch. rastonii*; Japan. Chiu 1954b, p. 56. Uchida 1954, pp. 209–19: Japan. Uchida 1955*a*, p. 15: Japan. Kramp 1956*a*, p. 5: Marquesas Islands, Pacific. Southcott 1958, p. 58, fig. 2E: *C. rastoni.* Yamazi 1958, p. 138: Tanabe Bay, Japan.

Carybdea sivickisi Stiasny 1926

10–12 mm high, 12–14 mm wide; exumbrella warty; sensory niches without well developed covering scale; tentacles simple.

Stiasny 1926*a*, p. 240, figs. 1–4: *Charybdea sivickisi* n.sp.; Philippines. Bigelow 1938, pp. 136–9: ? =*C. aurifera* Mayer.

Carybdea stiasnyi Bigelow 1938

23 mm high, 20 mm wide, with an apical depression; exumbrella smooth; sensory niches enclosed by a pair of covering scales below and by one above; phacellae in horizontal clusters in the corners of the stomach; tentacles with lateral branches.

Stiasny 1930*c*, p. 3, figs. 1–7: as *Charybdea* sp.; New Guinea. Bigelow 1938, p. 136: *Carybdea stiasnyi* n.sp.

Genus ***Tamoya*** Müller 1859

Carybdeidae with four simple pedalia; stomach deep, connected with the subumbrella by well developed perradial mesenteries; gastric cirri in bands extending vertically along the walls of the stomach, in the interradii.

Type-species: *T. haplonema* Müller.

Müller 1859*b*, p. 1: *Tamoya* n.g. Haeckel 1880, p. 442. Mayer 1910, p. 512: *Tamoya* in part. Bigelow 1938, p. 150: revision.

Tamoya gargantua Haeckel 1880 (non Lesson 1830)

Up to 220 mm high and 135 mm wide; ? =*T. haplonema.*

Haeckel 1880, p 444: *Tamoya gargantua* n.sp.; Samoa Islands. Maas 1903, p. 4: as *T. bursaria* n.sp.; Malay Archipelago. Kishinouye 1910, p. 7, Pl. 1, fig. 10: as *T. virulenta* n.sp.; Japan. Mayer 1910, p. 512: *Bursarius cythereae* Lesson 1830 from New Guinea and *T. bursaria* Maas 1909, probably =*Carybdea alata* var. *grandis*; p. 726: *T. virulenta*=*C. alata.* Stiasny 1919*a*, p. 38, figs. 6–11: as *T. bursaria*; Malay Archipelago. Stiasny 1929*c*, p. 196: as *T. alata* (=*T. bursaria*); Malaya. Uchida 1929*b*, p. 172, figs. 81–8: as *T. alata*, =*T. virulenta*; Japan. Stiasny 1930*c*, p. 5: as *T. alata*; New Guinea. Rao 1931*a*, p. 27: as *T. alata*; Indian Ocean; p. 28:

as *Tamoya* sp. Stiasny 1935, p. 10: as *T. alata*; Malay Archipelago. ?Menon 1936, p. 2: as *Tamoya* sp.; India. Stiasny 1937*a*, p. 210, figs. 1–3: as *T. alata*; Arabian Sea. Stiasny 1937*b*, p. 204: as *T. alata*; Malay Archipelago. Bigelow 1938, pp. 150, 151: discussion of *T. bursaria* and *alata*, probably = *T. gargantua* Haeckel; *bursaria* obsolete name. Ranson 1945*b*, p. 314: as *T. bursaria*; Indochina. Uchida 1947*a*, pp. 314-16, figs. 12, 13: as *T. bursaria*, *T. virulenta* Kishinouye 1910 and *alata* Uchida 1929 and Stiasny 1929–37; N. Australia. Pope 1951, pp. 270–2: as *Tamoya*; New South Wales, Australia. Uchida 1954, pp. 209–19: as *T. bursaria*; Japan. Kramp 1956*b*, p. 237: *T. gargantua* Haeckel, non Lesson; discussion of the specific name; *bursaria* should not be used; Iranian Gulf. Kramp 1958*b*, p. 371: as *T. bursaria*; Mergui Archipelago, Indian Ocean. Yamazi 1958, p. 138: as *T. bursalis*; Tanabe Bay, Japan.

Tamoya haplonema Müller 1859

90 mm high, 55 mm wide; exumbrella with nematocyst warts; sensory niches on ovoid prominences of exumbrella, bounded above and below by a rounded covering-scale; velar canals complexly forked (opposite to *Carybdea*).

Müller 1859*b*, p. 1, Pls. 1, 2: *Tamoya haplonema* n.g., n.sp.; Brazil. Haeckel 1880, p. 443: *T. haplonema* and *prismatica* n.sp.; West Indies. Mayer 1910, p. 513, Pl. 57, fig. 2; east coast of U.S.A., north to Long Island. Bigelow 1914*b*, p. 25: New England, east coast of U.S.A. Boone 1928, p. 1: West Indies. Boone 1933, p. 39: Bahamas; West Indies. Stiasny 1934*a*, p. 339, fig. 1: description; French Congo. Bigelow 1938, p. 151, figs. 17–23: Bermudas. Ranson 1949, p. 137: French Guinea; Senegambia; Luderitz Bay, S.W. Africa. Kramp 1955*a*, p. 287: off Sierra Leone, W. Africa. Vannucci 1957*a*, pp. 594–6: (Brazil). Kramp 1959*b*, p. 15: West Africa.

Genus ***Tripedalia*** Conant 1897

Carybdeidae with four interradial groups of tentacular pedalia, each tentacle being mounted upon a separate, unbranched pedalium which arises from the bell margin.

Type-species: *T. cystophora* Conant.

Conant 1897, p. 9: *Tripedalia* n.g. Mayer 1910, p. 513.

Tripedalia cystophora Conant 1897

12 mm high, 15 mm wide; four interradial groups, each with three separate pedalia, each with one tentacle; six unforked velar canals in each quadrant.

Conant 1897, p. 9, fig. 9: *Tripedalia cystophora* n.g., n.sp.; Jamaica, W. Indies. Mayer 1910, p. 514: text-fig. 330. Stiasny 1926*a*, p. 243: Philippines.

Family *CHIRODROPIDAE*

Cubomedusae with four interradial clusters of tentacles; the four stomach pouches with eight diverticula.

Genus ***Chirodropus*** Haeckel 1880

Chirodropidae with eight branched, or feathered sac-like projections from the four perradial stomach pouches into the bell cavity; the free margins of the eight gonads have grape-like swellings.

Type-species: *C. gorilla* Haeckel.

HAECKEL 1880, p. 447: *Chirodropus* n.g. MAYER 1910, p. 518.

Chirodropus gorilla Haeckel 1880

Up to 150 mm high, 120 mm wide; each pedalium with 9–11 tentacles upon as many long, tapering, finger-like processes.

HAECKEL 1880, p. 448, Pl. 26, figs. 1–8: *Chirodropus gorilla* n.g., n.sp.; W. Africa. MAYER 1910, p. 518, text-fig. 332. VANHÖFFEN 1920, p. 17: W. Africa. THIEL 1928, p. 16: W. Africa. STIASNY 1931*a*, p. 139: S. Africa. KRAMP 1955*a*, p. 288, figs. 9–12: new description; Liberia, W. Africa; p. 308: reference to Haeckel. KRAMP 1959*b*, p. 17, figs. 2, 3*a*, 3*b*, 4: off Moanda, West Africa; new description.

Chirodropus palmatus Haeckel 1880

100 mm high, 70 mm wide; each pedalium with 21 fingers and tentacles.

HAECKEL 1880, p. 448: *Chirodropus palmatus* n.sp.; near St Helena, off west coast of Africa. MAYER 1910, p. 519.

Chirodropus sp. Stiasny 1922

STIASNY 1922*e*, p. 555: *Chirodropus* sp.; Philippines.

Genus ***Chironex*** Southcott 1956

Chirodropidae in which the eight gastric saccules projecting into the bell cavity from the perradial stomach pouches are functioning gonads; the gonads along the interradii inside the stomach pouches obliterate.

Type-species: *C. fleckeri* Southcott.

SOUTHCOTT 1956, pp. 259–80: *Chironex* n.g.

Chironex fleckeri Southcott 1956

Up to 118 mm high; each pedalium with up to 12 fingers and tentacles; gastric saccules in pairs as lobulated projections from upper portion of the stomach pouches.

SOUTHCOTT 1956, pp. 259–80, Pls. 1, 2, figs. 1, 3, 4, Pl. 3, text-figs. 1–23: *Chironex fleckeri* n.g., n.sp.; Australia. SOUTHCOTT 1958, p. 58; 1959, pp. 572 ff., fig. 3.

Genus ***Chiropsalmus*** L. Agassiz 1862

Chirodropidae with finger-shaped, unbranched, hernia-like pouches which project from the four perradial stomach pouches into the bell cavity; the free margins of the eight leaf-shaped gonads entire and simple.

Type-species: *C. quadrumanus* (Müller).

L. Agassiz 1862, p. 174: *Chiropsalmus* n.g. Haeckel 1880, p. 446. Mayer 1910, p. 515. Thiel 1928, p. 7: as *Chiromedusa* n.g. Thiel 1936*a*, pp. 298 ff.: genus *Chiromedusa* is referred to *Chiropsalmus*.

Chiropsalmus buitendijki Horst 1907

65–70 mm high and wide; each pedalium with five or six fingers and tentacles in a linear series on the outer side of the main shaft: eight long, simple, finger-shaped subumbrella gastric saccules, nearly as long as the depth of the bell cavity.

Horst 1907, p. 101, Pl. 2, figs. 1–6: *Chiropsalmus buitendijki* n.sp.; Java. Mayer 1910, p. 515. Stiasny 1919*a*, p. 46, figs. 12–14: Malay Archipelago. Stiasny 1926*b*, p. 249: Australia. Menon 1936, p. 2: India. Ranson 1945*b*, p. 314: Indochina. Nair 1951, p. 71: Trivandrum coast, India. Pope 1953*b*, p. 111: Australia. Southcott 1956, p. 276: comparison with *Chironex fleckeri*. Kramp 1959*b*, p. 16: comparison with *C. quadrumanus*.

Chiropsalmus quadrigatus Haeckel 1880

70–100 mm high, 80–100 mm wide or more; each pedalium with 5–9 fingers and tentacles, irregularly placed; eight gastric saccules laterally flattened and cock's-comb-shaped.

Haeckel 1880, p. 447: *Chiropsalmus quadrigatus* n.sp.; Rangoon, Indian Ocean. Mayer 1910, p. 516, text-fig. 331: Philippines. Light 1914*a*, pp. 291–5: Philippines. Light 1914*b*, p. 197: Philippines. Mayer 1915*a*, p. 171: Philippines. Mayer 1917*a*, p. 190, fig. 4: Philippines. Stiasny 1922*e*, p. 517: Johore Strait; Rangoon. Thiel 1928, p. 13, fig. 6: remarks. Stiasny 1931*a*, p. 139: Philippines. Thiel 1935*a*, p. 5, fig. 5: poisonous effect. Menon 1936, p. 2: India. Stiasny 1937*a*, p. 213, figs. 4–9: new description; Maldive Islands, Indian Ocean. Ranson 1945*b*, p. 314: Indochina; Gulf of Thailand. Pope 1953*b*, p. 111, fig.: Australia. Kramp 1955*b*, p. 162. Southcott 1956, pp. 254, 255, 258: report on stinging; pp. 265, 270: comparison with *Chironex fleckeri* n.sp. Searle 1957, p. 70, fig. 1: Singapore. Southcott 1958, p. 58. Kramp 1959*b*, p. 16: comparison with *C. quadrumanus*. Southcott 1959, pp. 574, 576.

Chiropsalmus quadrumanus (Müller 1859)

100 mm high, 140 mm wide; each pedalium with 7–9 fingers and tentacles, irregularly placed; each of the four gastric saccules gives rise to two finger-shaped, hernia-like sacs.

Müller 1859*b*, pp. 1–11, Pls. 2, 3, figs. 18–32: as *Tamoya quadrumanus* n.sp.; coast of Brazil. L. Agassiz 1862, p. 174: *Chiropsalmus quadrumanus* n.g. Mayer 1910, p. 515, Pl. 57, fig. 3: North Carolina, east coast of U.S.A. Krumbach 1925, p. 574: Sumatra. Stiasny 1926*b*, p. 250, fig. 1: Australia. Rao 1931*a*, p. 28: Indian

Ocean. RANSON 1945*b*, p. 314: French Guiana, S. America. RANSON 1949, p. 137: mouth of Amazone. VANNUCCI 1954, p. 120, Pl. 5, figs. 1–6: description; São Paulo, Brazil. SOUTHCOTT 1956, pp. 270, 272–4, Pl. 2, fig. 2: comparison with *Chironex fleckeri* n.sp. VANNUCCI 1957*a*, pp. 594–6: Brazil. KRAMP 1959*b*, p. 16, fig. 1: West Africa; Venezuela, South America; comparison with other species.

Chiropsalmus zygonema Haeckel 1880

60 mm high, 40 mm wide; each pedalium with only two, asymmetrical fingers and tentacles; the finger-like stomach pouches very small.

HAECKEL 1880, p. 641: *Chiropsalmus zygonema* n.sp.; coast of Argentine. MAYER 1910, p. 517. THIEL 1928, p. 15: remarks; is considered = *C. quadrigatus*. SOUTHCOTT 1956, p. 277.

Order CORONATAE

Scyphomedusae with the umbrella margin cleft into lappets; with a single mouth opening provided with simple lips; with sense organs (rhopalia) and solid marginal tentacles arising from clefts between the lappets; with a circular, coronal furrow in the exumbrella, and peripheral to this a zone of gelatinous thickenings (pedalia) divided by radiating clefts alternating in position with the tentacles and rhopalia.

Family *ATOLLIDAE*

Coronatae with numerous (more than eight) marginal sense organs (rhopalia) which alternate with an equal number of tentacles; marginal lappets twice as numerous as the tentacles.

Genus ***Atolla*** Haeckel 1880

Atollidae with eight adradial gonads and four interradial subgenital ostia; disk quite flat, central part lenticular, circular furrow deep.

Type-species: *A. wyvillei* Haeckel.

HAECKEL 1880, p. 488: as *Atolla* n.g. and *Colaspsis* n.g. MAYER 1910, p. 561: probably only one species.

Atolla parva Russell 1958

Up to 30 mm wide; basal attachment of stomach clover-shaped; marginal septa straight and covered by coronal muscle; usually 20 or 24 tentacles.*

RUSSELL 1958, p. 1811: *A. parva* n.sp.: Bay of Biscay. RUSSELL 1959*a*, pp. 33–40, figs. 2*a*, 3: biology and growth.

Atolla vanhoeffeni Russell 1957

Up to 30 mm wide; basal attachment of stomach cruciform; with two pigmented spots in each of the gastric ostia; with 20 tentacles.

KRAMP 1924, p. 44: as *A. bairdii* in part; Portugal. RUSSELL 1957, pp. 275–9, Pl. 1, text-fig. 1: *Atolla vanhoeffeni* n.sp.; west of English Channel. PETERSEN 1957, p. 43: northern Atlantic, between Ireland and Newfoundland. RUSSELL 1958, p. 1811. RUSSELL 1959*a*, pp. 33–40.

Atolla wyvillei Haeckel 1880

Up to 150 mm wide; basal attachment of stomach clover-shaped; with up to 32, usually about 22, tentacles; marginal septa diverging at their proximal ends, not completely covered by coronal muscle.

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* F. S. Russell tells me that he has now seen some specimens with 22 tentacles.

Haeckel 1880, p. 488: *Atolla wyvillei* n.g., n.sp.; p. 489: as *Colaspis achillis* n.g., n.sp.; Antarctic Sea. Fewkes in Verrill 1885, p. 594: as *A. verrillii* n.sp. Fewkes 1886, p. 936, Pls. 1–3, as *A. bairdii* n.sp. Maas 1897, p. 80, Pl. 12, figs. 2–4, Pl. 13, figs. 7–9, Pl. 14, fig. 6: as *A. gigantea* n.sp.; Gulf of Panama. Vanhöffen 1902, p. 12, Pl. 1, figs. 1, 2, Pl. 5, fig. 26: as *A. chuni* n.sp.; off Cape of Good Hope; p. 13, Pl. 1, fig. 3, Pl. 5, fig. 21, Pl. 6, figs. 41–6, Pl. 7: as *A. bairdii* f. *valdiviae*; tropical Indian Ocean. Hartlaub 1909*c*, p. 477, Pl. 77, figs. 1, 2: as *A. tenella* n.sp.; off N.E. Greenland. Browne 1910, p. 47, Pl. 7, fig. 2: Antarctic Ocean. Mayer 1910, p. 563, text-fig. 357: as *A. bairdii*; (Atlantic); p. 565: as *A. bairdii* f. *valdiviae*; Philippines; p. 565, text-fig. 359: as *A. gigantea*; (Gulf of Panama, Pacific coast of Central America); p. 566, text-fig. 360: as *A. chuni* (off the Cape of Good Hope); p. 566, text-fig. 361: *A. wyvillei*; (Antarctic, southern Atlantic, southern and tropical Pacific); Philippines; p. 567: as *A. wyvillei* f. *verrilli*; (Atlantic, Indian and Pacific oceans). Bigelow 1913, p. 86: discussion of species; from San Francisco to Unalaska; Bering Sea; Japan. Kramp 1913*a*, p. 279: as *A. bairdii*; W. Greenland. Broch 1914, p. 14: *A. wyvillei*; central northern Atlantic; as *A. bairdii*: variation; *A. verrilli bairdii*; northern Atlantic. Kramp 1914, p. 453: as *A. bairdii*; W. and E. Greenland. Mayer 1915*a*, p. 175: *A. wyvillei*; variation; p. 178: as *A. bairdi* f. *valdiviae*; Philippines. Browne 1916*a*, p. 203: N.E. of Chagos and Providence, Indian Ocean. Mayer 1917*a*, p. 199, fig. 7: as *A. bairdii* f.*valdiviae*; p. 195: as *A. bairdii* var. *wyvillei*; Philippines. Kramp 1920*b*, p. 7: as *A. bairdi*: N.E. Atlantic. Stiasny 1922*e*, p. 518: as *A. bairdii*; Misaki, Japan. Kramp 1924, p. 44, map: as *A. bairdii*; Bay of Biscay. Kramp & Damas 1925, p. 239: Norway. Krumbach 1925, p. 589. Bigelow 1928, p. 505: discussion of species; p. 508: *A. wyvillei*; Galapagos to Cocos Islands; S. of Bermudas; off Cape Hatteras; off Chesapeake Bay; off New York. Thiel 1928, p. 31: as *A. bairdi*; tropical Atlantic; p. 32: as *A. bairdi* f. *verrilli*; Indian Ocean. Rao 1931*a*, p. 27: Bay of Bengal; Andaman Sea; Laccadive Sea. Stiasny 1931*a*, p. 139: Cape Adare, Antarctic. Stiasny 1931*b*, p. 29: Tasman Sea. Boone 1933, p. 41: eastern tropical Pacific. Stiasny 1934*a*, p. 365: discussion of species; p. 366, Pl. 15, fig. 4, text-figs. 3–6: *A. wyvillei*; southern Atlantic; p. 379, Pl. 14, figs. 3, 4, Pl. 15, fig. 5, text-figs. 7–9: as *A. chuni*; southern Atlantic. Stiasny 1937*a*, p. 221, map: Arabian Sea; Zanzibar, E. Africa. Bigelow 1938, p. 160: discussion of species; Bermudas. Bigelow 1940, p. 315: eastern tropical Pacific, from Costa Rica to Colombia. Stiasny 1940*a*, p. 14, Pl. 1, fig. 2, text-figs. A, B, map: Pacific, Indian and Atlantic oceans. Kramp 1942, p. 109: W. Greenland. Ranson 1945*b*, p. 314: Straits of Gibraltar. Ranson 1945*c*, p. 32, Pl. 2, fig. 13: eastern Atlantic; Nova Scotia. Kramp 1947, p. 47, map: northern Atlantic; depths of Northern Polar Sea. Uchida 1947*b*, p. 341: Japan. Kramp 1948*a*, p. 11: N.W. of South Georgia; S. of South Orkney Islands. Kramp 1948*b*, p. 22: northern Atlantic. Moore 1949, p. 9: as *A. wyvillei* f. *bairdii*; Bermudas. Yashnov 1952, p. 96: off Kamchatka. Fraser 1954*a*, p. 31: as *A. bairdi*; Scotland. Fraser 1954*b*, p. 100: as *A. bairdi*; Shetland Islands. Uchida 1954, pp. 209–19: as *A. wyvillei* and *bairdi*; Japan. Kramp 1955*a*, p. 292: W. coast of Africa. Naumov 1956*b*, p. 38. Kramp 1957*b*, pp. 160, 162: near Tasmania; S.W. of Australia; Antarctic Sea. Petersen 1957, p. 44: N. Atlantic. Russell 1957*a*, pp. 275–9: comparison with *A. vanhoeffeni*. Nicol 1958, p. 717: off Portugal; Bay of Biscay. Russell 1959*a*, pp. 33–40, figs. 1, 2*b*: biology and growth; comparison with *A. parva*.

Family *ATORELLIDAE*

Coronatae with six rhopalia.

Genus ***Atorella*** Vanhöffen 1902

Atorellidae with six rhopalia, six tentacles, and 12 pedalia alternating with 12 lappets; ring muscle poorly developed; four or six gonads.

Type-species: *A. subglobosa* Vanhöffen.

VANHÖFFEN 1902, p. 33; *Atorella* n.g. BIGELOW 1909*a*, p. 30. MAYER 1910, p. 567.

Atorella arcturi Bigelow 1928

Central disk 15 mm wide, marginal zone 7–8 mm broad, including lappets; 12 lappets, longer than broad, rounded at the tip; base of stomach asymmetrical, stomach four-sided; six gonads (two interradial and four adradial); six long tentacles without terminal knobs; six rhopalia; colourless.

BIGELOW 1928*b*, p. 502, figs. 180, 181: *Atorella arcturi* n.sp.; Cocos Island, tropical Pacific.

Atorella subglobosa Vanhöffen 1902

15–17 mm wide, globular, exumbrella smooth; ring furrow not very deep; marginal lappets shallow, slightly cleft; about 20 gastric filaments in each of the four groups; four interradial sac-like, swollen gonads; tentacles without terminal knob.

VANHÖFFEN 1902, p. 33, Pl. 3, fig. 11: *Atorella subglobosa* n.g., n.sp.; east coast of Africa. BIGELOW 1909*a*, p. 30. MAYER 1910, p. 568, text-fig. 362: (Malay Archipelago). RANSON 1945*c*, p. 29, Pl. 2, fig. 14: W. of Canary Islands.

Atorella vanhoeffeni Bigelow 1909

7 mm wide, 3–5 mm high; exumbrella with nematocyst warts; ring furrow deep; marginal lappets long, oval; 80–100 gastric cirri in each of the four groups, each group arising from a stout gelatinous peduncle; four leaf-shaped gonads; tentacles with a terminal knob-shaped swelling.

BIGELOW 1909*a*, p. 30, Pls. 1, 11, 12: *Atorella vanhoeffeni* n.sp.; off Panama. MAYER 1910, p. 568, text-fig. 363.

Family *LINUCHIDAE*

Coronatae with eight rhopalia, eight tentacles, and 16 marginal lappets; with zones of subumbrellar hernia-like protuberances; 16 radiating stomach pouches break up into numerous ragged-edged branches in the marginal lappets.

Genus ***Linantha*** Haeckel 1880

Linuchidae with only four, interradial gonads.

Type-species: *L. lunulata* Haeckel.

HAECKEL 1880, p. 494: *Linantha* n.g. VANHÖFFEN 1902, p. 50: discussion; *Linantha*, incl. *Linerges* and *Liniscus*. MAAS 1903, p. 23: discussion; *Linantha* retained.

Linantha lunulata Haeckel 1880

10 mm wide, 6 mm high; the four gonads crescent-shaped, simple; subumbrella without hollow protuberances. Doubtful species.

HAECKEL 1880, p. 494, Pl. 29, figs. 1–3: *Linantha lunulata* n.g., n.sp.; Galapagos Islands. MAYER 1910, p. 560: *L. lunulata* possibly the young of *Linuche aquila*.

Genus ***Linuche*** Eschscholtz 1829

Linuchidae with a flat apex and vertical sides; marginal lappets bluntly oval; with eight (four double) gonads; subumbrella with 2–3 circles of hollow protuberances which arise from the radial stomach pouches.

Type-species: *L. unguiculata* (Schwartz).

ESCHSCHOLTZ 1829, p. 91: *Linuche* n.g. HAECKEL 1880, pp. 495, 496, 498, 642: as *Linerges, Liniscus* and *Linuche*. MAYER 1910, p. 557.

Linuche draco (Haeckel 1880)

20 mm wide, 18 mm high; subumbrellar protuberances in two circles; probably = *L. unguiculata*.

HAECKEL 1880, p. 496: as *Linerges draco* n.g., n.sp.; China Sea. MAAS 1903, p. 24, Pl. 1, figs. 1, 2: as *Linerges draco*. MAYER 1910, p. 560: ?synonym of *L. aquila*. BIGELOW 1928*b*, p. 510: *L. draco* probably = *L. unguiculata*. THIEL 1928, p. 27: *L. draco* a valid species; New Britain. STIASNY 1931*b*, p. 30: supports Bigelow. BIGELOW 1938, p. 163: *L. draco* probably = *L. unguiculata*. KRAMP 1955*b*, p. 163.

Linuche unguiculata (Schwartz 1788)

16 mm wide, 13 mm high; subumbrellar protuberances in three circles (*L. unguiculata*) or in two circles (*L. aquila*); the eight gonads form four cleft crescents.

SCHWARTZ 1788, p. 195, Pl. 6, fig. 1: as *Medusa unguiculata* n.sp. ESCHSCHOLTZ 1829, p. 91: *Linuche unguiculata* n.g. HAECKEL 1880, pp. 495, 496, 497, 498, 499, Pl. 29, figs. 4–6: as *Linerges mercurius, aquila, pegasus* and *Liniscus ornithopterus*(?), *sandalopterus*(?), *cyamopterus* and *Linuche unguiculata* and *vesiculata*. MAYER 1910, p. 558, Pl. 59, figs. 1–10, text-fig. 356A: *L. unguiculata*; western tropical Atlantic; p. 560, Pl. 59, fig. 11, text-fig. 356B, C: as *L. aquila*; (tropical Pacific). VANHÖFFEN 1913*a*, p. 429: West Indies. MAYER 1915*a*, pp. 160, 174, fig. 1: Philippines; Torres Strait, N. of Australia. MAYER 1917*a*, p. 194, fig. 6: as *L. unguiculata* var. *aquila*; Philippines. BIGELOW 1918, p. 401: Bermudas; Straits of Florida. STIASNY 1924*a*,

p. 486, fig. 1: as *L. unguiculata* var. *aquila*; Malay Archipelago. Bigelow 1928*b*, p. 510, figs. 182–4: Cocos Island, tropical Pacific; S.E. of Bermudas. Thiel 1928, p. 26: as *L. unguiculata* var. *aquila*; Haïti. Stiasny 1931*a*, p. 139: Bahama Islands. Stiasny 1931*b*, p. 30: Solomon Islands, Polynesia. Stiasny 1935, p. 13: Malay Archipelago. Stiasny 1937*b*, p. 205. Bigelow 1938, p. 163: Bermudas. Stiasny 1940*a*, p. 13, Pl. 1, fig. 3: New Caledonia; Fiji Islands; between Bermudas and Cape Hatteras. Ranson 1945*b*, p. 314: Cuba; p. 315: as *L. aquila*. Berrill 1949*b*, pp. 393–409: development. Moore 1949, p. 9: Bermudas. Hedgpeth 1954, p. 278: Gulf of Mexico. Kramp 1955*a*, pp. 307, 308: =*Liniscus sandalopterus* Haeckel from Sierra Leone; uncertain if *L. unguiculata* *Liniscus ornithopterus* and *L. cyamopterus* as stated by Mayer. Kramp 1955*b*, p. 162: by Haeckel 1880 determined as *Linerges pegasus, mercurius*, and *Liniscus sandalopterus*.

Family *NAUSITHOIDAE*

Coronatae with eight rhopalia, eight tentacles, and 16 marginal lappets; without sac-like pouches upon the subumbrella; 16 radiating stomach pouches simple.

Genus ***Nausithoë*** Kölliker 1853

Nausithoidae with eight adradial gonads.

Type-species: *N. punctata* Kölliker.

Kölliker 1853, p. 323: *Nausithoë* n.g. Haeckel 1880, pp. 486, 487: as *Nausicaa, Nausithoë* and *Nauphanta.*

Nausithoë albatrossi (Maas 1897)

35–40 mm wide, 35 mm high; central disk smooth; stomach very short; gonads elongate, oval, bladder-like; each row of gastric cirri composed of about four clusters of five cirri each.

Maas 1897, p. 83, Pl. 14, figs. 1–3: as *Nauphanta albatrossi* n.sp.; Gulf of Panama. Mayer 1910, p. 557. Kramp 1952, p. 10: probably a valid species; Chile.

Nausithoë atlantica Broch 1914

28 mm wide; exumbrella smooth; gonads almost coalescent in the interradii, separated by narrow spaces in the perradii; tentacular pedalia longer but less prominent than the rhopalar; colour dark yellowish-brown or almost black. ?=*N. rubra.*

Broch 1914, p. 10, Pl. 1, figs. 1–4, map: *Nausithoë atlantica* n.sp.; S. of the Azores; W. of Bay of Biscay. Bigelow 1928*b*, p. 498: probably =*N. rubra.* Ranson 1945*c*, p. 25: Canary Islands. Russell 1956*b*, p. 363, Pl. 1, figs. 1, 2, 5: west of English Channel.

Nausithoë challengeri (Haeckel 1880)

12 mm wide; similar to *N. punctata*, but central disk with radiating furrows.

Haeckel 1880, p. 487: as *Nauphanta challengeri* n.sp.; Tristan da Cunha, S. Atlantic. Mayer 1910, p. 556. Bigelow 1928*b*, p. 498: probably = *N. punctata*. Stiasny 1931*a*, p. 139: as *Nauphanta challengeri*.

Nausithoë clausi Vanhöffen 1892

9 mm wide; central disk smooth; marginal lappets very short and broad (? shrunk); gastric cirri numerous, in a linear row in each interradius; very small gonads.

Vanhöffen 1892, p. 14, Pl. 4, figs. 1, 2: *Nausithoë clausi* n.sp.; E. of Caroline Islands, tropical Pacific Ocean. Mayer 1910, p. 556.

Nausithoë globifera Broch 1914

17 mm wide; central disk high, arched, solid, covered with nettle-spots; pedalia not prominent; lappets broad and rounded, equidistant; gonads large, almost quadrangular, in pairs, the pairs close together; colour: stomach brownish or quite black, gonads light brownish, yellowish or reddish.

Broch 1914, p. 12, Pl. 1, figs. 5–8, text-fig. 6: *Nausithoë globifera* n.sp.; N.E. Atlantic. Kramp 1920*b*, p. 7: N.E. Atlantic. Bigelow 1928*b*, p. 498: probably = *N. rubra*. Ranson 1945*c*, p. 25: off Portugal; off Capo de Finisterre, N.W. Spain. Kramp 1947, p. 46: a valid species; W. of Scotland; S. of Iceland. Russell 1956*b*, p. 363, Pl. 1, figs. 3, 4, 6: west of English Channel.

Nausithoë limpida Hartlaub 1909

Similar to *N. punctata*; the median members of each group of gastric cirri arise from a centripetal, radial fold of the dorsal wall of the stomach.

Hartlaub 1909*c*, p. 14, Pl. 77, figs. 3–5: *Nausithoë limpida* n.sp.; N.E. Greenland. Kramp 1914, p. 449. ?Kramp 1920*b*, p. 7: N.E. Atlantic. Bigelow 1928*b*, p. 498: probably = *N. punctata*. Kramp 1943, p. 12.

Nausithoë picta Agassiz & Mayer 1902

15–22 mm wide; similar to *N. punctata*, but with chocolate brown or carmine gonads and blue gastric cirri.

Agassiz & Mayer 1902, p. 154, Pl. 7, fig. 33: *Nausithoë picta* n.sp.; South Pacific. Mayer 1910, p. 557: probably = *N. punctata*; (Malay Archipelago).

Nausithoë punctata Kölliker 1853

9–15 mm wide, discoidal, central disk thick, without radiating furrows, finely punctured; gastral filaments not grouped in clusters; large gonads.

Kölliker 1853, p. 323: *Nausithoë punctata* n.g., n.sp.; Mediterranean. Haeckel 1880, p. 486. Mayer 1910, p. 554, text-figs. 352–3, Pl. 60, figs. 4, 5: all oceans. Bigelow 1913, p. 85: Japan. Vanhöffen 1913*a*, p. 428: Tortugas, Florida. Mayer

1915*a*, p. 160: Torres Straits, N. of Australia. Browne 1916*a*, p. 202: Chagos and Amirante Islands, Indian Ocean. Bigelow 1917, p. 306: off Georges Bank, east coast of U.S.A. Bigelow 1918, p. 401: off Chesapeake Bay, U.S.A. Stiasny 1919*b*, p. 70: as *N. punctata* var. *pacifica*; Malay Archipelago; Saba, W. Indies. Kramp 1924, p. 42, map: Mediterranean; Bay of Cadiz. Bigelow 1928*b*, p. 497: discussion of species; *N. challengeri*, *picta* and *limpida* probably = *N. punctata*; p. 498: Galapagos Islands. Thiel 1928, p. 25: Naples; Messina, Italy. Candeias 1930, p. 6: off Portugal. Menon 1930, p. 5, Pl. 1, fig. 5: Madras, India. Stiasny 1931*a*, p. 139: Naples, Italy; Ceylon. Stiasny 1934*a*, p. 365: Gulf of Guinea; Cape of Good Hope. Weill 1934*b*, p. 545: nematocysts. Komai 1935, pp. 289–339: Japan. Stiasny 1935, p. 12: as *N. punctata* var. *pacifica*; Malay Archipelago. Komai 1936*b* p. 535. Stiasny 1937*a*, p. 220, map: Maldive Islands, Indian Ocean. Stiasny 1937*b*, p. 204. Bigelow 1938, p. 159: Bermudas. Komai & Tokuoka 1939, p. 127, figs. 1–7: polyp *Stephanoscyphus racemosus*; Japan. Zirpolo 1939, p. 123: Naples, Italy. Stiasny 1940*a*, p. 13, Pl. 1, fig. 3, map: tropical Pacific. Ranson 1945*b*, p. 314: Mediterranean. Uchida 1947*a*, p. 317: as *Nausithoë* sp. (?*punctata*); Palao Islands, Pacific. Berrill 1949*b*, pp. 393–409: development. Fraser & Saville 1949*b*, pp. 61, 63: Scottish waters. Moore 1949, p. 9: Bermudas. Fraser 1950, p. 95: northern North Sea. Nair 1951, p. 71: Trivandrum coast, India. Fraser 1952*a*, p. 34: as *Nausithoë*; Scotland-Faroe area. George 1953, p. 82: Calicut, southern India. Chiu 1954*b*, p. 56: as *N. punctata* and (?) *N. polaris*. Fraser 1954*a*, p. 31: Scottish waters. Hedgpeth 1954, p. 278: Gulf of Mexico. Uchida 1954, pp. 209–19: Japan. Fraser 1955, pp. 7, 12: British Isles. Kramp 1955*a*, p. 293, fig. 13: from Liberia to Angola, W. Africa. Kramp 1955*b*, p. 163: by Haeckel determined as *Liniscus cyamopterus*. Horridge 1956*b*, pp. 377–78: innervation; Naples. Searle 1957, p. 72, fig. 2: as *Nausithoë* sp.; Singapore. Yamazi 1958, p. 139: Tanabe Bay, Japan. Kramp 1959*b*, p. 21: Congo and Angola, West Africa.

Nausithoë rubra Vanhöffen 1902

15 mm wide; central disk with large pits; lappets short, pointed; gastric cirri arise separately, not in clusters; eight large gonads, horse-shoe-shaped, with the concavity inwards; no ocelli; red colour.

Vanhöffen 1902, p. 30, Pl. 1, figs. 4, 5: *Nausithoë rubra* n.sp.; Indian Ocean; S. Atlantic. Bigelow 1909*a*, p. 36, Pl. 12, fig. 6: E. tropical Pacific. Mayer 1910, p. 557, text-fig. 355. Bigelow 1928*b*, p. 499: probably = *N. atlantica* and *globifera*; near Galapagos Islands. Ranson 1945*c*, p. 24, Pl. 2, fig. 9: S. of the Azores; W. of Canary Islands.

Genus ***Palephyra*** Haeckel 1880

Nausithoidae with four interradial gonads.

Type-species: *P. antiqua* Haeckel.

Haeckel 1880, pp. 482–4, 641: as *Ephyra*, *Palephyra* and *Zonephyra*. Mayer 1910, p. 551.

Palephyra antiqua Haeckel 1880

20 mm wide, 8 mm high; 6–8 slender gastric filaments in each interradius; the four gonads crescent-shaped with the horns recurved.

Haeckel 1880, p. 482, Pl. 27, figs. 1, 2: as *Ephyra prometor* n.sp.; Australia; p. 483, Pl. 27, figs. 3–6: as *Palephyra primigenia* n.g., n.sp.; Red Sea; p. 484: as *Palephyra antiqua* n.sp.; east of Madagascar. Mayer 1910, p. 551, text-figs. 348, 350: *Palephyra antiqua*.

Palephyra indica Vanhöffen 1902

12–16 mm wide; about 20 simple gastric filaments in each interradius; the four gonads are large, bean-shaped, much wider than the spaces between them.

Vanhöffen 1902, p. 32, Pl. 3, fig. 10: *Palephyra indica* n.sp.; Gulf of Aden. Mayer 1910, p. 553. Stiasny 1940*a*, p. 13: Fiji Islands; New Caledonia; New Zealand.

Palephyra pelagica (Haeckel 1880)

12 mm wide, 2 mm high; 10–12 short gastric filaments in each interradius; the four gonads are crescent-shaped, each consisting of three swellings.

Haeckel 1880, pp. 484, 485, Pl. 27, figs. 7, 8: as *Zonephyra zonaria* n.g., n.sp.; China; and *Z. pelagica* n.sp.; Japan. Mayer 1910, p. 552, text-fig. 349: *Palephyra pelagica*. Uchida 1954, pp. 209–19; Japan.

Family *PARAPHYLLINIDAE*

Coronatae with four perradial rhopalia and with four or more tentacles.

Genus ***Paraphyllina*** Maas 1903

Paraphyllinidae with 12 tentacles and 16 marginal lappets; four pairs of interradial gonads.

Type-species: *P. intermedia* Maas.

Maas 1903, p. 6: *Paraphyllina* n.g. Mayer 1910, p. 549. Russell 1956*a*, pp. 105–11: historic review of *P. intermedia*.

Paraphyllina intermedia Maas 1903

15 mm wide, 8 mm high, flatly rounded, without pointed apex; circular furrow deep; marginal lappets oval, bluntly pointed; the 16 pedalia rectangular with rounded angles; the four rhopalar pedalia half as wide as the 12 tentacular; gonads four pairs of bean-shaped or egg-shaped sacs; ring muscle 16 trapezoids; ocelli with lens; stomach red-brown in interradial parts.

Maas 1903, p. 8, Pl. 2, figs. 10–14, Pl. 11, fig. 106: *Paraphyllina intermedia* n.g., n.sp.; Malay Archipelago. Mayer 1910, p. 549, text-fig. 347: (Naples, Italy). Russell 1956*a*, pp. 105–10: comparison with *P. ransoni* n.sp.

Paraphyllina ransoni Russell 1956

Up to 35 mm wide (25 mm at coronal groove); umbrella with dome-shaped apex; rhopalar pedalia slightly narrower than the tentacular; marginal lappets evenly rounded; eight adradial gonads W-shaped; ring muscle continuous; no ocelli with lens; brownish-red coloration over whole medusa.

RANSON 1936*a*, pp. 269–76: as *Paraphyllina intermedia*; Biarritz, Bay of Biscay. RUSSELL 1956*a*, pp. 105–11, Pls. 1, 2, text-figs. 1–3: *P. ransoni* n.sp.; western mouth of English Channel. KRAMP 1959*b*, p. 21: off Liberia, West Africa; young specimen.

Paraphyllina rubra Neppi 1915

15 mm wide; exumbrella finely pitted; the eight gonads elongate, slightly curved, smooth sacs with large, distinctly oval eggs, the position of which varies within the same specimen, the eggs not arranged in pairs; the disk rusty brown, stomach and filaments darker; gonads dark brown, tentacles colourless. Probably = *P. intermedia*.

NEPPI 1915, p. 4: *Paraphyllina rubra* n.sp.; Adriatic Sea. GROBBEN 1915, p. 4.

Family *PERIPHYLLIDAE*

Coronatae with four interradial rhopalia and with four or more (up to 28) tentacles.

Genus ***Nauphantopsis*** Fewkes 1885

Periphyllidae with 28 (4 × 7) tentacles; 32 marginal lappets; gonads?

Type-species: *N. diomedeae* Fewkes.

FEWKES 1885, p. 596: *Nauphantopsis* n.g. MAYER 1910, p. 548.

Nauphantopsis diomedeae Fewkes 1885

70 mm wide, quite flat; the 32 lappets long and rectangular with rounded outer edges. Colour?

FEWKES 1885, p. 596: *Nauphantopsis diomedeae* n.g., n.sp.; off New England, east coast of U.S.A. FEWKES 1886, p. 946, Pl. 6, figs. 1, 2. MAYER 1910, p. 548.

Genus ***Pericolpa*** Haeckel 1880

Periphyllidae with four perradial tentacles; eight adradial lappets; eight gonads, adradial or on both sides of the four interradii.

Type-species: *P. quadrigata* Haeckel.

HAECKEL 1880, pp. 413, 414, 640: as *Pericolpa* n.g. and *Pericrypta* n.g. MAYER 1910, p. 541.

Pericolpa campana (Haeckel 1880)

15 mm wide and high, with thick walls; the dome-like apex evenly rounded; the 4 tentacular pedalia similar in size to the four rhopalar ones; marginal lappets semicircular; gonads oval, almost equidistant.

HAECKEL 1880, p. 414: as *Pericrypta campana* n.g., n.sp.; New Zealand. MAAS 1903, p. 13, Pl. 3, figs. 19–22: *Pericolpa campana*; Malay Archipelago. MAYER 1910, p. 542.

Pericolpa quadrigata Haeckel 1880

30 mm wide, 40 mm high; the dome-like apex pointed; the four perradial, tentacular pedalia somewhat wider than the four interradial, rhopalar ones and somewhat longer than the eight marginal lappets, which are elongate, somewhat pointed; gonads in four pairs, their inner ends close together near the interradii, diverging outwards.

HAECKEL 1880, p. 413, Pl. 23, figs. 1–12: *Pericolpa quadrigata* n.g., n.sp.; S.E. of Kerguelen Island, Antarctic; p. 414: as *P. galea* n.sp.; east coast of Australia. MAYER 1910, p. 542.

Pericolpa tetralina Haeckel 1880

16 mm wide, 20 mm high; similar to *P. quadrigata*, but both ends of the eight gonads diverge from the four interradii.

HAECKEL 1880, p. 640: *Pericolpa tetralina* n.sp.; south coast of Australia. MAYER 1910, p. 542: probably = *P. quadrigata*.

Genus ***Periphylla*** Haeckel 1880

Periphyllidae with 12 (4 × 3) tentacles (four perradial and eight adradial), 16 marginal lappets, and eight gonads.

Type-species: *P. periphylla* (Péron & Lesueur).

HAECKEL 1880, p. 418: *Periphylla* n.g. MAYER 1910, p. 543. KRAMP 1947, p. 40: historic review of the genus; discussion of generic and specific names; only species *P. periphylla* (Péron & Lesueur).

Periphylla periphylla (Péron & Lesueur 1809)

Up to 200 mm wide, usually higher than wide, with a pointed or dome-shaped apex; gonads U-shaped; stomach and subumbrella purple or violet.

PÉRON & LESUEUR 1809, p. 20: as *Carybdea periphylla*. BLAINVILLE 1834, p. 275, Pl. 31, fig. 1: as *C. periphylla*. STEENSTRUP 1837; *Periphylla hyacinthina* n.sp., in litteris. HAECKEL 1880, p. 419, Pl. 24, figs. 11–16: as *P. hyacinthina*; p. 421: as *P. dodecabostrycha* n.sp.; p. 421: as *P. regina* n.sp.; p. 442: as *P. mirabilis* n.sp. BIGELOW 1909*a*, p. 26, Pls. 1, 9: *P. dodecabostrycha* – *hyacinthina*. BROWNE 1910, p. 42, Pl. 7, fig. 1: discussion; as *P. dodecabostrycha*; Antarctic. MAYER 1910, p. 544, text-figs. 342, 343: as *P. hyacinthina*; p. 546: as *P. hyacinthina* f. *dodecabostrycha*, probably a variety or growth-stage of *P. hyacinthina*; p. 546, text-fig. 344: as *P. hyacinthina* f. *regina* (incl. *mirabilis* Haeckel); deep-sea of all oceans. BIGELOW 1913, p. 84: as *P. hyacinthina*; discussion of species; S. of Alaska; Bering Sea; Japan;

Sea of Okhotsk; Kamchatka. Kramp 1913*a*, p. 277: as *P. hyacinthina*; W. Greenland. Bigelow 1914*b*, p. 27: as *P. hyacinthina*; east coast of U.S.A. Broch 1914, p. 4, fig. 1: *P. dodecabostrycha*=*hyacinthina*; p. 8: as *P. regina*; northern Atlantic. Kramp 1914, p. 450: as *P. hyacinthina*; W. Greenland; Denmark Strait; Irminger Sea. Mayer 1915*a*, p. 173: as *P. hyacinthina* incl. *dodecabostrycha*; Philippines. Mayer 1917*a*, p. 193, fig. 5: as *P. hyacinthina*; Philippines. Bigelow 1918, p. 401: as *P. hyacinthina*; Chesapeake Bay, U.S.A. Kramp 1920*b*, p. 7: as *P. hyacinthina*; N.E. Atlantic. Bigelow 1922, pp. 138, 159: as *P. hyacinthina*; off Long Island, east coast of U.S.A. Kramp 1924, p. 40, map: as *P. hyacinthina*; Mediterranean; Cadiz Bay; off Bay of Biscay. Kramp & Damas 1925, p. 239: as *P. hyacinthina*; Norway. Bigelow 1926, p. 365. Havnø 1926, p. 286: as *P. hyacinthina*; northern Norway. Bigelow 1928, pp. 495, 496: as *P. hyacinthina*; discussion of species; Galapagos and Cocos Islands; from Sargasso Sea to S.E. of Bermudas; Bermudas; off Cape Hatteras and New York, east coast of U.S.A. Rao 1931*a*, p. 26: as *P. hyacinthina*; Bay of Bengal; Laccadive Sea, Indian Ocean. Stiasny 1931*a*, p. 139: as *P. regina* and *dodecabostrycha*. Runnström 1932, p. 31: as *P. hyacinthina*; Herdlafjord, Norway. Boone 1933, p. 40: as *P. hyacinthina*; eastern tropical Pacific. Stiasny 1934*a*, p. 342: discussion of species: *P. dodecabostrycha* and *regina* =*hyacinthina*; p. 345, Pl. 14, figs. 1, 2, Pl. 15, figs. 1–3, text-fig. 2, map: measurements, distribution; southern Atlantic. Stiasny 1935, p. 11: as *P. hyacinthina*; Malay Archipelago. Stiasny 1937*a*, p. 218, map: as *P. hyacinthina*; Arabian Sea; Zanzibar, E. Africa. Stiasny 1937*b*, p. 204: as *P. hyacinthina*. Bigelow 1938, p. 155: as *P. hyacinthina*; discussion of species; Bermudas. Kramp 1939*a*, p. 20: as *P. hyacinthina*; Iceland. Bigelow 1940, p. 314: as *P. hyacinthina*; eastern tropical Pacific. Stiasny 1940*a*, p. 6, map: as *P. hyacinthina*; discussion of species; Pacific, Indian and Atlantic oceans. Kramp 1942, p. 106: as *P. hyacinthina*; W. Greenland. Stiasny & Maaden 1943, p. 232: as *P. hyacinthina*; Sea of Okhotsk. Ranson 1945*b*, p. 314: as *P. hyacinthina*; western Mediterranean. Ranson 1945*c*, p. 7, Pl. 2, fig. 12: as *P. hyacinthina*; Mediterranean; eastern Atlantic. Kramp 1947, p. 42, map: *P. periphylla*; northern Atlantic; the specific name *hyacinthina* invalid. Uchida 1947*b*, p. 341: as *P. hyacinthina*; Japan. Johnsen 1948, p. 222: as *P. hyacinthina*; Norway. Kramp 1948*a*, p. 11: N.W. of South Georgia, Antarctic. Kramp 1948*b*, p. 21: S.W. of the Azores. Moore 1949, p. 9: as *P. hyacinthina*; Bermudas. Fraser 1950, pp. 93, 95: as *P. hyacinthina*; northern North Sea. Fraser 1952*a*, p. 34: as *Periphylla*; W. of Ireland. Yashnov 1952, p. 96: off Kamchatka. Rees 1953*a*, p. 8: as *P. hyacinthina*; Herdlafjord, Norway. Chiu 1954*b*, p. 56: as *P. hyacinthina*. Uchida 1954, pp. 209–19: as *P. hyacinthina*; Japan. Fraser 1955, pp. 7, 12: British Isles. Kramp 1955*a*, p. 293: off Liberia, W. Africa; p. 308: =*P. bicolor* Haeckel from between Cape Verde Islands and Africa. Kramp 1955*b*, p. 161: =*P. hyacinthina* Haeckel 1880. Fraser 1956, p. 27: as *Periphylla*; Denmark Strait. Naumov 1956*b*, p. 38: as *P. hyacinthina*. Petersen 1957, p. 44: N. Atlantic. Kramp 1957*b*, pp. 160, 162: Antarctic Sea; north of Kerguelen. Kramp 1957*c*, p. 1: Macquarie Island, Antarctic. Nicol 1958, p. 719: Bay of Biscay. Rossi 1958, pp. 4, 12: Ligurian Sea, Mediterranean.

Genus ***Periphyllopsis*** Vanhöffen 1900

Periphyllidae with 20 (4×5) tentacles; 24 marginal lappets; four or eight gonads.

Type-species: *P. braueri* Vanhöffen.

Vanhöffen 1900, p. 278: *Periphyllopsis* n.g. Mayer 1910, p. 547.

Periphyllopsis braueri Vanhöffen 1902

60 mm wide, 25 mm high, flattened; ring furrow deep; coronal muscle very weak; eight gonads, equidistant, oval; the entire endodermal system chocolate-red.

VANHÖFFEN 1902, p. 27, Pl. 2, fig. 7: *Periphyllopsis braueri* n.g., n.sp.; Indian Ocean. BIGELOW 1909*a*, p. 28, Pls. 9, 12: off Peru. MAYER 1910, p. 547, text-figs. 345, 346.

Periphyllopsis galatheae Kramp 1959

Up to 380 mm wide, flattened; four gonads, very large, horse-shoe-shaped, lobate; central disk and 24 radiating lines on peripheral part of umbrella chocolate-brown.

KRAMP 1959*c*, p. 257, fig. 19: *P. galatheae* n.sp.; off Mombasa, East Africa, in deep water.

Order SEMAEOSTOMEAE

Scyphomedusae with umbrella margin cleft into lappets; without a coronal furrow and without pedalia; with (or without) hollow marginal tentacles and with marginal rhopalia; with a single central mouth opening provided with four large curtain-like or gelatinous lips; with gonads in sac-like folds of the endodermal wall of the subumbrella.

Family *PELAGIIDAE*

Semaeostomeae in which the central stomach gives rise to completely separated, unbranched radiating pouches; without a ring-canal; tentacles arise from the umbrella margin between the clefts of the lappets; oral arms long, pointed, much folded.

Genus ***Chrysaora*** Péron & Lesueur 1809

Pelagiidae with 32–48 (or more) simple marginal lappets; with eight marginal sense-organs; with three or more (up to nine) tentacles between each successive pair of marginal sense-organs; with 16 radial stomach pouches; in the marginal zone the eight rhopalar stomach pouches are much narrower than the eight tentacular pouches; exumbrella with numerous minute nematocyst warts. All the specific characters are vague and variable.

Type-species: *C. hysoscella* (L.).

Péron & Lesueur 1809, p. 364: *Chrysaora* n.g. L. Agassiz 1862, p. 166: as *Dactylometra* n.g. Haeckel 1880, pp. 510, 517: *Chrysaora* and *Dactylometra*. Kishinouye 1902, p. 9: as *Kuragea* n.g. Mayer 1910, pp. 577, 583, 589: as *Chrysaora*, *Dactylometra* and *Kuragea*. Bigelow 1913, p. 90: revision of *Dactylometra*. Stiasny 1919*b*, pp. 75 ff.: revision of *Dactylometra*. Stiasny 1939*a*, p. 183: *Chrysaora* cannot be separated from *Dactylometra*; p. 184: *Kuragea* = *Chrysaora*. Ranson 1949, p. 138: discussion, *Dactylometra* and *Chrysaora* are different. Kramp 1955*a*, p. 297: *Dactylometra* and *Kuragea* = *Chrysaora*.

Chrysaora africana (Vanhöffen 1902)

100–130 mm wide; five long tentacles in each octant; lappets and tentacles red; red radial streaks over exumbrella. Probably = *C. fulgida*.

Vanhöffen 1902, p. 40, Pl. 4, fig. 20: as *Dactylometra africana* n.sp.; S.W. Africa. Mayer 1910, p. 588, text-fig. 373: as *D. africana*. Bigelow 1913, p. 91: remarks, *D. africana* allied to *D. quinquecirrha*. non Mayer 1915*a*, p. 180: as *D. africana*; Philippines; South China. non Mayer 1917*a*, p. 201: as *D. africana*; Philippines; South China. Light 1921, p. 30: as *D. africana*; doubts the validity of Mayer's determination. STIASNY 1939*a*, p. 174, text-fig. 2: *D. africana* probably an older stage of *Chrysaora fulgida.* RANSON 1949, p. 142: as *D. africana*; W. Africa. KRAMP 1955*a*, pp. 298, 309: =*C. quinquecirrha* (erroneous).

Chrysaora blossevillei Lesson 1830

Doubtful species; no adequate description.

LESSON 1830, p. 115, Pl. 13, fig. 2: *Chrysaora blossevillei* n.sp.; Brazil. HAECKEL 1880, p. 514. non VANHÖFFEN 1888, p. 15, Pl. 1, fig. 3: Brazil. MAYER 1910, p. 581: as *C. hysoscella* var. *blossevillei* in part; the diagnosis based on the description given by Vanhöffen, and is thus invalid. ?VANNUCCI 1954, p. 123, Pl. 6, figs. 1, 2: as *C. hysoscella*; Brazil (new locality).

Chrysaora depressa (Kishinouye 1902)

85 mm wide, 30 mm high. In each octant the tentacular lappets decrease in size from the median pair towards both sides; the two rhopalar lappets as large as the median tentacular lappets; up to seven or nine tentacles per octant; septa between stomach pouches straight until near margin, but in the middle of their length the rhopalar pouches are distinctly broader than the tentacular pouches; exumbrella with a 16-rayed stellate figure, resembling that of *C. hysoscella*, but reaching almost from centre outwards.

KISHINOUYE 1902, p. 9, Pl. 1, fig. 7: as *Kuragea depressa* n.g., n.sp.; Japan. MAYER 1910, p. 589, text-fig. 374: as *K. depressa.* STIASNY 1922*e*, p. 519, fig. 2: probably = *C. quinquecirrha* var. *pacifica* Goette; Japan. UCHIDA 1927*b*, p. 230: as *K. depressa*, non =*Dactylometra pacifica.* UCHIDA 1935, p. 44: Stiasny's *K. depressa* 1922 is 'nothing but specimens belonging to *D. pacifica*'. UCHIDA 1954, pp. 209–19.

Chrysaora fulgida (Reynaud 1830)

Up to 200 mm wide (or more?); central part of umbrella with base of oral arms particularly thick and cartilaginous; basal part of oral arms particularly broad; septa between stomach pouches straight until very near margin; in each octant four tentacular and two rhopalar marginal lappets, all of equal size, thick, with many small lobate diverticula from stomach pouches. Eight by five tentacles, all alike; exumbrella with 16 broad, dark, radial bands alternating with as many narrow streaks, confluent around bell margin.

REYNAUD 1830, p. 79, Pl. 25: as *Rhizostoma fulgidum* n.sp.; Cape of Good Hope, South Africa. MAYER 1910, p. 581: as *Chrysaora hysoscella* var. *fulgida.* VANHÖFFEN 1920, p. 17: *C. fulgida.* STIASNY 1934*a*, p. 388: Cape of Good Hope. STIASNY 1939*a*, pp. 172–85, figs. 1–7: as *Dactylometra fulgida*; historic review, description and discussion; *D. africana* Vanh. probably =*fulgida*; Walvis Bay, S. Africa. RANSON 1945*b*, p. 316. KRAMP 1955*a*, p. 298: *D. africana* non = *fulgida.*

Chrysaora helvola Brandt 1838

Up to 300 mm wide, hemispherical or flatter; rhopalar stomach pouches oval, in middle portion twice as wide, at the margin half as wide as tentacular pouches; three tentacles per octant; umbrella yellowish-brown or reddish-yellow, with a 32-rayed chestnut-brown star on exumbrella.

Brandt 1838*a*, p. 384, Pl. 15, text-figs. 1–4: *Chrysaora* (*Polybostrycha*) *helvola* n.sp.; northern Pacific Ocean. Haeckel 1880, p. 515. Vanhöffen 1906, p. 48, text-fig. 11. Mayer 1910, p. 581, text-fig. 366: *C. helvola* (northern Pacific); p. 582: as *C. helvola* var. *calliparea* (Reynaud); (east coast of India; Zanzibar); p. 582: as *C. helvola* var. *chinensis* Vanh. 1888; (Hong Kong, China). Rao 1931*a*, p. 30: Bay of Bengal; *Dactylometra quinquecirrha* Light 1921 from the Philippines probably – *C. helvola*. Uchida 1935, p. 43, fig. 2: Japan. Uchida 1940*a*, p. 294: Japan. Uchida 1954, pp. 209–19. Vannucci 1954, p. 125: *C. helvola*=*callipara* and *chinensis*. Naumov 1956*b*, p. 38.

Chrysaora hysoscella (Linné 1766)

Up to about 200 mm wide; marginal lappets all alike, semicircular, thin; stomach pouches all of equal width, septa straight until very near margin; in each octant three tentacles all alike; exumbrella typically with 16 broad radial brown bands bordered by still darker, narrow V-shaped lines; marginal lappets brown.

Linné 1766, p. 1097: as *Medusa hysoscella* n.sp. Péron & Lesueur 1809, pp. 365, 366: as *Chrysaora cyclonata* etc. Eschscholtz 1829, p. 79, Pl. 7, fig. 2: *Chrysaora hysoscella*. Haeckel 1880, pp. 511, 513, Pl. 31, figs. 1–3: as *C. mediterranea* and *isosceles*. Vanhöffen 1906, p. 47, figs. 9, 10*a*, *b*: *C. hysoscella*=*mediterranea*. Mayer 1910, p. 579: *C. hysoscella*; (Mediterranean and Atlantic coasts of Europe). Hadži 1911*a*, p. 406: as *Chrysaora* sp. Hadži 1912*b*, pp. 52–3, figs. 1–4: *Chrysaora*; Adriatic Sea. Hadži 1912*c*, pp. 578–89, figs. 1–26: *Chrysaora*; Adriatic Sea. Hérouard 1912, pp. xi-xxv, figs. 1–6: *Chrysaora*; Roscoff, France. Jordan 1912, pp. 134 ff.: *Chrysaora*. Le Danois 1913*b*, p. 14: the Hebrides, Scotland. Le Danois 1913*c*, p. 351: northern Atlantic. Le Danois 1913*d*, p. 287: Bay of Biscay. Broch 1914, p. 21: as *C. mediterranea*; Algeciras, Spain. Hérouard 1914, pp. 810–12: as *C. isosceles*; English Channel. Stiasny 1919*b*, p. 72: Katwijk, Holland. Schaefer 1921, pp. 49–59, figs. 1–2: *Chrysaora*. Lebour 1923, p. 73, fig. 1: as *C. isosceles*; food; Plymouth. Kramp 1924, p. 53, fig. 38: Mediterranean. Kramp & Damas 1925, p. 239: Norway. Teissier 1925, pp. 530–2: embryology; Roscoff, France. Schodduyn 1926, p. 40: Pas de Calais, English Channel. Teissier 1926, pp. 266–73: Roscoff, France. Teissier, L. & G. 1926, pp. 412–19, figs. 1–16: Roscoff. Weill 1926*a*, p. 259: nematocysts. Okada 1927*b*, p. 255, figs. 3–5: embryology. Stiasny 1927, pp. 73–86, Pls. 1–3: colour-variation; Holland. Chuin 1928, pp. 790–1: as *C. isosceles*; Roscoff, France. Chuin 1929*a*, pp. 1005–7, fig. 1: as *C. isosceles*. Chuin 1929*b*, pp. 520–2: as *Chrysaora*. Chuin 1929*c*, pp. 557–8: as *Chrysaora*. Chuin 1929*d*, pp. 531–5, figs. 1–4: as *C. isosceles*. Teissier 1929, pp. 137–78, figs. 1–10, tab. I-III: development; Roscoff, France. Chuin 1930, pp. 1–179, figs. 1–50: as *Chrysaora*; development. Stiasny 1930*a*, p. 7: *C. hysoscella*; Belgium; English Channel; p. 10: as *C. mediterranea*; Villefranche-sur-Mer, France. Mar. Biol. Ass. 1931, p. 85: as *C. isosceles*; Plymouth. Stiasny, 1931*a*, p. 139: *C. hysoscella*; British coasts; as *C. mediterranea*; Naples, Italy. Teissier 1932*a*, p. 160: chemical composition of planula. Berntrop 1934, p. 2084: North Sea coast of Holland. Kramp 1934*a*, pp. 211–21: unusual occurrence in

Denmark. KRAMP 1934*b*, pp. 234–40: Denmark. WEILL 1934*b*, p. 541: as *C. isosceles*; nematocysts. LAMBERT 1936, p. 71, Pl. 3: as *C. isosceles*; Essex coast, England. PAPENFUSS 1936, p. 19, figs. 8, 13, 17, 22: nematocysts; Kristineberg, Sweden. KRAMP 1937*b*, p. 173, figs. 73*b*, 75: Denmark. STIASNY 1937*c*, pp. 273 ff.: comparison with *C. plocamia*. RENOUF 1939, p. 523: as *C. isosceles*; Ireland. WOOLLARD & HARPMAN 1939*a*, pp. 361–2: as *C. isosceles*; nervous system. WOOLLARD & HARPMAN 1939*b*, pp. 559–62: as *C. isosceles*; nervous system. MAADEN 1942*a*, pp. 347–62: Holland. VERWEY 1942, p. 410: Holland. FOX & PANTIN 1944, p. 122: pigmentation. RANSON 1945*b*, p. 316: Stornoway; France. CUTCLIFF 1946, p. 171: as *C. isosceles*; Ilfracombe, England. LELOUP 1947, p. 44: Belgium. BERRILL 1949*b*, pp. 393–410: development. ANON 1951, p. 805: as *Chrysaora*; British coasts. KÜNNE 1952, pp. 14, 32: S.E. North Sea. SMIDT 1952, p. 95: Danish Waddensea. CHAPMAN 1953*a*, pp. 161, 170, fig. 3: as *C. mediterranea*; physiology of mesogloea; Whitstable, England. NEWELL 1954, p. 330: as *C. isosceles*; Kent, England. ?VANNUCCI 1954, p. 123, Pl. 6, figs. 1, 2: off coast of Brazil. KRAMP 1955*a*, p. 296, fig. 14: Liberia and Monrovia, W. Africa. ALVARADO 1956, pp. 219–20: *C. hysoscella* with *Hyperia* (Amphipoda); Rio de Vigo, Atlantic coast of Spain. BASSINDALE & BARRET 1957, p. 247: Wales. VANNUCCI 1957*a*, pp. 594–6: Brazil. CARTHY 1958, p. 197: responses to stimuli. THIEL 1958*b*, p. 45.

Chrysaora lactea Eschscholtz 1829

Up to 80 mm wide; clefts in lappets adjacent to the rhopalia fully as deep as those between the remaining lappets; septa between stomach pouches straight until very near margin; usually five, but sometimes seven or nine tentacles per octant, the two secondary tentacles in each octant about half, the two tertiary about 1/4 as long as the median, primary tentacles, the others successively diminishing in length towards both sides; all tentacles issuing from clefts between lappets.

ESCHSCHOLTZ 1829, p. 81, Pl. 7, fig. 3: *Chrysaora lactea* n.sp.; Brazil. HAECKEL 1880, p. 517: as *Dactylometra lactea*. MAYER 1910, p. 583, text-figs. 369–70: as *D. lactea*; Jamaica and Cuba. BIGELOW 1913, p. 91: comparison with *C. pacifica*; measurements of specimens from Cuba. STIASNY 1919*b*, p. 76: *D. lactea* a valid species. RANSON 1949, p. 141: as *D. lactea*; Cabo de Vela, Colombia. KRAMP 1955*a*, p. 299: provisionally retained as *C. lactea*. VANNUCCI 1957*a*, pp. 594–6: Brazil.

Chrysaora melanaster Brandt 1838

Up to 300 mm wide, about 1/3 as high as wide; marginal lappets of almost equal size and shape; septa between stomach pouches straight, rhopalar pouches in middle portion somewhat broader, at margin considerably narrower than the tentacular pouches; 3–5 tentacles per octant; 32 radiating reddish or brown streaks on exumbrella and moreover 16 radiating dark-brown, almost black, streaks on subumbrella below the septa between the stomach pouches.

BRANDT 1838*a*, p. 385, Pls. 16, 17: *Chrysaora melanaster* n.sp.; Kamchatka. L. AGASSIZ 1862, pp. 126, 166: as *Melanaster mertensii* n.g.; California. KISHINOUYE 1892,

p. 261, Pl. 2: as *Dactylometra longicirra* n.sp.; Japan; p. 264, Pl. 3: as *D. ferruginaster* n.sp.; Japan. Kishinouye 1899*b*, p. 44, fig. 1: as *C. gilberti* n.sp.; California. Vanhöffen 1906, p. 49, fig. 12: *C. melanaster.* Kishinouye 1910, p. 11, Pl. 2, figs. 11–14: as *C. convoluta* n.sp.; Japan. Mayer 1910, p. 581: as *C. convoluta*, =*helvola*; p. 582, text-fig. 367: *C. melanaster*; (from Kamchatka to California); p. 582: as *C. melanaster* var. '*gilberti*'; p. 588: as *D. ferruginaster*; p. 589: as *D. longicirra*, probably identical with *ferruginaster*, and both growth-stages of *Kuragea depressa.* ?Bigelow 1913, p. 90: ?*C. melanaster*, determination uncertain; Aleutian Islands, Alaska; p. 92: as *D. pacifica*; synonyms: *D. quinquecirrha* var. *pacifica* Goette 1886, *ferruginaster* and *longicirra* Kish. 1892, *Kuragea depressa* Kish. 1902; Japan. Mayer 1915*a*, p. 179, fig. 2: Philippines. Mayer 1917*a*, p. 200, fig. 8: Philippines. Stiasny 1919*b*, p. 73: *C. melanaster*; Japan; p. 74: *C. convoluta* probably =*melanaster*; p. 81: as *D. pacifica.* Uchida 1927*b*, p. 229: as *D. pacifica*; Japan. Rao 1931*a*, p. 31: Bay of Bengal. Uchida 1935, p. 44: as *D. pacifica*; Japan. Koizumi & Hosoi 1936, pp. 709–19: as *D. pacifica*; Japan. Uchida 1938*a*, p. 148: as *D. pacifica*; Japan. Uchida 1938*b*, p. 44: as *D. pacifica*; Japan. Uchida 1938*c*, p. 57: as *D. pacifica*; Japan. Uchida 1940*a*, p. 294: as *D. pacifica*; Japan. Komai 1942, p. 26, figs. 2–4: as *D. pacifica*; physiology; Japan. Uchida 1947*b*, p. 342: as *D. pacifica*; Japan. Nair 1951, p. 72: Trivandrum coast, India (exumbrella golden yellow with radiating streaks of brown spots, lappets dark brown). Chiu 1954*b*, p. 56: as *D. pacifica.* Uchida 1954, pp. 209–19, fig. 2: as *D. pacifica* and *Kuragea depressa*; Japan. Vannucci 1954, p. 125: *C. gilberti* =*melanaster.* Uchida 1955*a*, p. 15: as *D. pacifica*; Loochoo Islands, S. of Japan. Hartman & Emery 1956, p. 307: as *Chrysaora gilberti*; off California, U.S.A. Naumov 1956*b*, p. 38. Uchida 1958, p. 164: as *D. pacifica*; Sado, Japan. Yamazi 1958, p. 139: as *D. pacifica*; Tanabe Bay, Japan.

Chrysaora pacifica (Goette 1886)

Unrecognizable species.

Goette 1886, p. 834: as *Dactylometra quinquecirrha* var. *pacifica* nov. var.; northern Pacific. (All later reports of *C. pacifica* belong to *melanaster* Brandt.)

Chrysaora plocamia (Lesson 1830)

Up to 300 mm wide, almost hemispherical; tentacular lappets, two per octant, broadly rounded, rhopalar lappets smaller; tentacles three in each octant; radial stomach pouches of equal width except the distal portion; exumbrella with 16 broad, radial bands of dark, brown colour with numerous light spots.

Lesson 1830, p. 116, Pl. 12, figs. 1, 2: as *Cyanea plocamia* n.sp.; coast of Peru. Haeckel 1880, p. 516: *Chrysaora plocamia.* ?Vanhöffen 1888, p. 16: Punta Arenas, Pacific coast of S. America. Mayer 1910, p. 581: as *C. blossevillei* var. *plocamia.* Stiasny 1937*c*, pp. 273–84, figs. 1–6: Vanhöffen's record (1888) from Punta Arenas doubtful; Chile. Kramp 1952, p. 14: Peru (new record). Kramp 1955*a*, p. 296: *C. plocamia* a distinct species.

Chrysaora quinquecirrha (Desor 1848)

Up to 250 mm wide; marginal lappets semicircular or tongue-shaped; the lappet-clefts of the primary and secondary tentacles deep, the tertiary mere shallow notches; stomach pouches all of equal width, septa straight until some distance from margin, where each of them makes an S-like bend before converging towards the rhopalar radius; in each octant three large tentacles and usually two (sometimes four) smaller ones issuing from subumbrella side of the rhopalar lappets; colour very variable, usually rather pale, yellowish or pink, sometimes in radiating stripes.

DESOR 1848, p. 76: as *Pelagia quinquecirrha* n.sp. L. AGASSIZ 1862, pp. 125, 166: as *Dactylometra quinquecirrha*. VANHÖFFEN 1888, p. 15, Pl. 1, fig. 3: as *Chrysaora blossevillei*; Brazil. MAYER 1910, p. 581: as *C. hysoscella* var. *blossevillei* in part; p. 585, Pls. 62–64A, text-figs. 371–2: as *D. quinquecirrha*; description; southern New England to Florida; Bermudas. BIGELOW 1913, p. 91: as *D. quinq.*; comparison with *C. pacifica*. BIGELOW 1914*b*, p. 27: as *D. quinq.*; New England. ?MAYER 1915*a*, p. 180: as *D. africana*; Philippines; South China. ?MAYER 1917*a*, p. 201: as *D. africana*. STIASNY 1919*b*, p. 75, Pl. 2, figs. 3–6, Pl. 3, figs. 7–9, text-figs. a–c.: as *D. quinq.*; detailed description; Malayan Archipelago. LIGHT 1921, p. 30: as *D. quinq.*; Philippines. STIASNY 1921*d*, p. 112, fig. 2: as *D. quinq.*; Semarang, Java. STIASNY 1924*b*, p. 46: as *D. quinq.*; Philippines. BIGELOW 1926, p. 365: as *D. quinq.*; south of Cape Cod, U.S.A. FISH 1926, pp. 125–6: as *D. quinq.*; Woods Hole. STIASNY 1929*c*, p. 198: as *D. quinq.*; Malayan Archipelago. COWLES 1930, pp. 331, 369: as *D. quinq.*; Chesapeake Bay, U.S.A. STIASNY 1931*a*, p. 139: as *D. quinq.*; Lagos, Gulf of Guinea. THIEL 1935*a*, p. 4, text-fig. 4: as *D. quinq.* PAPENFUSS 1936, p. 14, figs. 7, 11, 16, 20: as *D. quinq.*; p. 17, figs. 12, 21: as *D. quinq.* var. *chesapeaki*; Chesapeake Bay, east coast of U.S.A. LITTLEFORD & TRUITT 1937, p. 426: as *D. quinq.* LITTLEFORD 1939*a*, pp. 368–81, figs.: as *D. quinq.*; development; Chesapeake Bay, U.S.A. STIASNY 1940*a*, p. 22: as *D. quinq.*; Gulf of Siam. GRAVELY 1941, p. 12: as *D. quinq.*; Madras, India. NAIR 1946, p. 97: as *D. quinq.*; Travancore, India. PATIL 1951, p. 132: as *Dactylometra*; Karwar coast, India. HEDGPETH 1954, p. 278: as *D. quinq.*; Gulf of Mexico. KRAMP 1955*a*, p. 297: *Chrysaora quinquecirrha*; Gulf of Guinea, W. Africa; Angola; p. 309: = *D. africana* Vanh. 1902 from W. coast of Africa. SOUTHCOTT 1956, p. 258: as *D. quinq.*; report on stinging. SEARLE 1957, p. 74: as *D. quinq.* KRAMP 1958*b*, p. 372: Puri coast, Bay of Bengal. KRAMP 1959*b*, p. 23: West Africa. SOUTHCOTT 1959, p. 575, fig. 5: as *D. quinq.*

Chrysaora spp.

KISHINOUYE 1910, p. 13: *Chrysaora* sp.; Saghalin, N. of Japan. MORSE 1910, pp. 544–5: *Dactylometra* sp. STIASNY 1919*b*, p. 74: *Chrysaora* sp.; Cheribon, Java. BIGELOW 1920, p. 13H: *Chrysaora* sp.? arctic American Pacific. STIASNY 1922*e*, p. 518: *Chrysaora* sp.; Borneo. STIASNY 1930*d*, p. 32: *Chrysaora* sp.; off mouth of Congo. UCHIDA 1935, p. 43, text-fig. 2: *Chrysaora helvola*; Japan. MAC GINITIE 1955, pp. 42, 93, 104, 121: *Chrysaora* sp.; Point Barrow, Alaska.

Genus ***Pelagia*** Péron & Lesueur 1809

Pelagiidae with 16 marginal lappets; with eight marginal sense-organs; with eight tentacles alternating with the marginal sense-organs; with 16 radial stomach pouches, all alike, each terminating in a pair of unbranched canals entering the marginal lappets; exumbrella with numerous nematocyst warts.

Type-species: *P. noctiluca* (Forskål).

Péron & Lesueur 1809, p. 349: *Pelagia* n.g. Haeckel 1880, p. 504. Mayer 1910, p. 570. Bigelow 1928, pp. 517–19: probably only one species.

Pelagia noctiluca (Forskål 1775)

Up to about 65 mm wide; nematocyst warts on exumbrella very variable in size and number; colour very variable.

?Linné 1758, p. 660: as *Medusa pelagica* n.sp. Forskål 1775, p. 109: as *M. noctiluca* n.sp. Péron & Lesueur 1809, p. 349: as *Pelagia cyanella* n.g., n.sp., and *P. panopyra* n.sp.; p. 350: *P. noctiluca.* Eschscholtz 1829, p. 76, Pl. 6, fig. 3: as *P. flaveola* n.sp.; p. 76, Pl. 7, fig. 1: as *P. discoidea* n.sp. Haeckel 1880, p. 505: *P. noctiluca*; p. 506: as *P. phosphora* and *perla*; p. 507: as *P. cyanella*; p. 509: as *P. papillata* n.sp. and *panopyra*; p. 510: as *P. placenta* n.sp. Vanhöffen 1888, pp. 10, 12, Pl. 1, figs. 1, 2, Pl. 6, figs. 12, 13: as *P. crassa* n.sp. and *P. minuta* n.sp.; tropical Atlantic. Kishinouye 1910, p. 9: as *P. panopyra*; Japan. Mayer 1910, p. 572, Pl. 60, figs. 1–3: *P. noctiluca*; (Mediterranean and warm Atlantic); p. 574, Pl. 61, fig. 1: as *P. cyanella*; (east coast of America); p. 575: as *P. panopyra*; (tropical Pacific); as *P. panopyra* var. *placenta*; (tropical Pacific) Philippine Islands; p. 576: as *P. flaveola*; (tropical Pacific); as *P. perla*; (North Atlantic); as *P. phosphora*; (Atlantic and Indian oceans); as *P. crassa*; (tropical Atlantic). Schaxel 1910*a*. pp. 407–14, figs. 1–3: *P. noctiluca*; Mediterranean; oogenesis. Schaxel 1910*b*, pp. 167–212, Pls. 10–13, text-figs. A, B: oogenesis; Mediterranean. Bigelow 1913, p. 88: as *P. panopyra*; N.W. Pacific. Le Danois 1913*d*, p. 286: as *P. perla*; off Bay of Biscay. Bigelow 1914*b*, p. 27: as *P. cyanella*; New England, east coast of U.S.A. Broch 1914, p. 18, map: as *P. perla*; northern Atlantic. Stiasny 1914, p. 529, figs. 1, 2: as *P. purpuroviolacea* n.sp.; p. 531, figs. 3, 4: as *P. rosacea* n.sp.; Adriatic Sea. Grobben 1915, p. 4: ?as *P. perla*; Adriatic Sea. Mayer 1915*a*, p. 178: as *P. panopyra*; Philippines. Browne 1916*a*, pp. 204–6: as *P. panopyra* and *P.* sp. *B.*; Chagos Archipelago, Indian Ocean; as *P. flaveola* and *P.* sp. *A.*; N.E. of Madagascar. Int. Plankt. Catal. 1916, p. 45: as *P. perla*; English Channel; Ireland. Mayer 1917*a*, p. 199: as *P. panopyra*; Philippines. Stiasny 1919*b*, p. 72: *P. noctiluca*; Naples, Italy; as *P. rosacea* and *purpuroviolacea* Stiasny; Adriatic Sea. Vanhöffen 1920, p. 17: West Africa. Stiasny 1922*f*, p. 83, fig. 1: as *P. curaçaoensis* n.sp.; ? = *P. phosphora* Haeckel; West Indies; p. 84: as *P. minuta*, Pernambuco and *P. crassa*; Atlantic between Africa and S. America. Heymans & Moore 1923, pp. 430–2: physiology; Naples. Kramp 1924, p. 46, map: measures; N.E. Atlantic; Mediterranean. Ranson 1925*a*, p. 91, map. Ranson 1925*b*, p. 382. Bigelow 1926, p. 365: as *P. cyanella.* Weill 1926*a*, p. 259: nematocysts. Ranson 1927, figs. 1–3. Bigelow 1928, pp. 517–19: probably only one species of *Pelagia*; p. 519: *P. noctiluca*; Galapagos Islands to Panama; Bermudas. Stiasny 1929*c*, p. 197: as *P. panopyra*; Malay Archipelago. Menon 1930, p. 6, Pl. 1, fig. 1: Madras, India. Stiasny 1930*a*, p. 6: as *P. perla*; Belgium; p. 7: *P. noctiluca*; Villefranche-sur-Mer, Mediterranean. Nobre 1931, p. 26: Portugal. Rao 1931*a*, p. 29: Naples, Italy; Indian Seas. Stiasny 1931*a*, p. 139: as *P. panopyra*; Japan. Stiasny 1931*b*, p. 31: *P. noctiluca*, =*P. panopyra*; Port Jackson, Australia. Dakin & Colefax 1933, p. 198: as *P. panopyra*; New South Wales, Australia. Stiasny 1934*a*, p. 386: agrees that only one species exists; South Atlantic. Uchida 1934*b*, pp. 428–30, figs. 1–4: as *P. panopyra*; Japan. Weill 1934*b*, p. 540: as *P. perla*; nematocysts. Stiasny 1935, p. 14: *P. noctiluca*;

Malay Archipelago; p. 16, Pl. 1, fig. 5: as *P. flaveola*, a valid species. Uchida 1935, p. 43, fig. 1: as *P. panopyra*; Japan. Lambert 1936, p. 71: as *Pelagia*; Irish coast. Frost 1937, p. 26: Newfoundland. Stiasny 1937*a*, p. 223, map: Arabian Sea; Zanzibar, E. Africa. Bigelow 1938, pp. 164, 165: *P. panopyra* probably = *P. noctiluca*; Bermudas. Boone 1938, p. 45: Canary Islands. Russell 1938*c*, p. 497: Plymouth. Stiasny 1938, p. 15: Red Sea. Uchida 1938*c*, p. 57, fig. 7: as *P. panopyra*; Japan. Bigelow 1940, p. 315: Pacific off Costa Rica and Colombia. Legendre 1940, p. 140: Bay of Biscay. Stiasny 1940*a*, p. 20: Atlantic and Pacific. Ries & Ries 1941, pp. 69–72, figs. 1, 5–8: Naples. Komai 1942, p. 26, fig. 1: physiology; Japan. Fox & Pantin 1944, p. 122: *Pelagia*; pigmentation. Ranson 1945*b*, p. 315: as *P. noctiluca*; Mediterranean; Atlantic; Madagascar; Indian Ocean; Indochina; Australia; Peru; Pacific; Rio de Janeiro; as *P. noctiluca* var. *perla*; Atlantic; p. 316: as *P. flaveola*; Pacific. Ranson 1945*c*, p. 47: *P. noctiluca*; Canary Islands; east of Balearics, Mediterranean; p. 48: as *P. noctiluca* var. *perla*; Canary Islands; the Azores; Bay of Biscay; Sargasso Sea. Skramlik 1945, pp. 296–336: Naples. Kramp 1947, p. 48: northern Atlantic. Leloup 1947, p. 44: as *P. perla*; Belgium. Uchida 1947*a*, p. 317: as *Pelagia* sp.; South Pacific. Uchida 1947*b*, p. 342: as *P. panopyra*; Japan. Kramp 1948*a*, p. 12: Cape Verde Islands; W. of Spain. Kramp 1948*b*, p. 22: northern Atlantic. Fraser 1948, p. 43: as *P. perla*; N.E. of Scotland. Berrill 1949*b*, pp. 393–409: development. Moore 1949, p. 11: Bermudas. Ranson 1949, p. 138: as *P. noctiluca*; off Brazil; as *P. noctiluca* var. *perla*; coast of Guinea, W. Africa. Fraser 1950, p. 93: as *P. perla*; northern North Sea. Anon 1951, p. 805: as *Pelagia*; British coasts. Franc 1951, p. 28: ephyra-stage; French coast of the Channel. Nair 1951, p. 72: Trivandrum coast, India. Cole 1952, p. 587: as *P. perla*; invasion in Manx water, Irish Sea, in 1899. Hunt 1952, p. 934: as *Pelagia*; estuary of River Yealm, South Devon, England. George 1953, p. 82: Calicut, southern India. Fox & Millot 1954, pp. 392–408, figs. 1–11: as *P. noctiluca* var. *panopyra*; pigmentation; California. Fraser 1954*b*, p. 100: as *P. perla*; Scotland. Lubet 1954, p. 214: Arcachon, Bay of Biscay. Millot & Fox 1954, p. 169: pigmentation; California. Uchida 1954, pp. 209–19: Japan. Fraser 1955, pp. 4, 7, 12: British Isles. Kramp 1955*a*, p. 294: from Guinea to Angola, West Africa; p. 308: = *P. phosphora* Haeckel from Canary and Cape Verde Islands. Kramp 1955*b*, pp. 163, 164: by Haeckel 1880 determined as *P. perla, phosphora* and *cyanella*. Uchida 1955*a*, p. 15: as *P. panopyra*; Formosa and Okinawa. Fraser 1956, p. 26: east of the Faroes; p. 53: west of Scotland. Hartman & Emery 1956, p. 307: as *P. cyanella*; California. Kramp 1956*a*, p. 240: Iranian Gulf. Bouillon & Vandermeerssche 1957, pp. 9–25, figs. 2, 6: histology of mesogloea. Vannucci 1957*a*, pp. 594–6: as *P. cyanella* and *phosphora*; Brazil. Uchida 1958, p. 164: as *P. panopyra*; Sado, Japan. Rossi 1958, p. 4: Ligurian Sea, Mediterranean. Thiel 1958*b*, p. 40: discussion on alternation of generations. Yamazi 1958, p. 139: as *P. panopyra*; Tanabe Bay, Japan. Chapman 1959, pp. 599–610, figs. 1–7: mesogloea. Horridge 1959, p. 89. Kramp 1959*b*, p. 22: West Africa.

Genus *Sanderia* Goette 1886

Pelagiidae with 32 cleft marginal lappets; with 16 marginal sense-organs; with 16 tentacles alternating with the marginal sense-organs; with 32 radial stomach pouches all alike; exumbrella with numerous nematocyst warts.

Type-species: *S. malayensis* Goette.

Goette 1886, p. 835: *Sanderia* n.g. Kishinouye 1910, p. 14: as *Neopelagia* n.g. Mayer 1910, p. 590.

Sanderia malayensis Goette 1886

About 90 mm wide; large nematocyst warts on central portion of exumbrella; the four interradial, heart-shaped, genital ostia each bordered externally by about 24–30 finger-shaped papillae.

Goette 1886, p. 835: *Sanderia malayensis* n.g., n.sp.; Singapore, Malaya. Kishinouye 1910, p. 14, Pl. 3, fig. 15: as *Neopelagia eximia* n.g., n.sp.; Japan. Mayer 1910, p. 590, text-fig. 375: = *N. eximia*; (Indian Ocean; East Africa); Philippines. Bigelow 1913, p. 90: Japan. Mayer 1915*a*, p. 180: Philippines. Mayer 1917*a*, p. 202, fig. 9: Philippines. Stiasny 1919*b*, p. 86: *S. malayensis*?; Malayan Archipelago. Browne 1926, p. 110: Suez Canal. Stiasny 1935, p. 18: Malayan Archipelago. Uchida 1935, p. 45: Japan. Stiasny 1937*a*, p. 225, Pl. 1, figs. 1–3, tex-tfig. 10: Arabian Sea. Stiasny 1937*b*, p. 206: Malayan Archipelago. Uchida 1938*a*, p. 148: Japan. Ranson 1945*b*, p. 316: Bay of Suez. Chiu 1954*b*, p. 56. Uchida 1954, pp. 209–19: Japan. Kramp 1956*b*, p. 240: Iranian Gulf. Searle 1957, p. 73. Yamazi 1958, p. 139: Tanabe Bay, Japan.

Family *CYANEIDAE*

Semaeostomeae in which the central stomach gives rise to radiating pouches which in turn give rise to numerous branching, blind canals in the marginal lappets; without a ring-canal; with gonads in complexly folded, interradial eversions of the wall of the subumbrella; with tentacles arising from the subumbrella at some distance from the margin.

Genus ***Cyanea*** Péron & Lesueur 1809

Cyaneidae with eight rhopalia; with eight adradial clusters of tentacles, each cluster contains several rows of tentacles; both radial and circular muscles in the subumbrella.

Type-species: *C. capillata* (Linné).

Péron & Lesueur 1809, p. 363: *Cyanea* n.g. Eschscholtz 1829, p. 67. Haeckel 1880, pp. 524–8: as *Procyanea, Medora, Stenoptycha, Desmonema* (in part) and *Cyanea*. Mayer 1910, p. 595. Stiasny & Maaden 1943, pp. 236–66, figs. 1–14: revision of species and varieties. Thiel 1958*b*, pp. 37–54: discussion on alternation of generations.

Cyanea annasethe (Haeckel 1880)

Young medusa; doubtful species.

Haeckel 1880, p. 526, Pl. 30, figs. 1–4: as *Desmonema annasethe* n.sp.; S.W. Africa. Mayer 1910, p. 601: young medusa, ?synonym of *C. annaskala*. Stiasny & Maaden 1943, p. 242: doubtful species.

Cyanea buitendijki Stiasny 1919

Up to 310 mm wide; rhopalar and tentacular stomach pouches connected by several broad, transverse anastomoses; peripheral canals without anastomoses; radial muscles entirely outside the periphery of the circular muscle band; horse-shoe-shaped insertions of tentacle groups 2–3 times as long as broad.

Stiasny 1919*b*, p. 87, Pl. 3, fig. 10: as *C. capillata* var. *buitendijki* nov. var.; Malay Archipelago. Stiasny & Maaden 1943, p. 254: a valid species *C. buitendijki*.

Cyanea capillata (Linné 1758)

Diameter up to 1000 mm; rhopalar and tentacular stomach pouches completely separated; peripheral canals more or less curved; without or with very few anastomoses; colour reddish-brown or yellowish.

Linné 1758, p. 660: as *Medusa capillata* n.sp. Péron & Lesueur 1809, p. 363: as *Cyanea arctica* n.g., n.sp. Eschscholtz 1829, p. 68: *C. capillata*. L. Agassiz 1862, pp. 119, 162: as *C. versicolor* n.sp., and *C. arctica*. von Lendenfeld 1882*a*, p. 465, Pls. 27–33: as *C. annaskala* n.sp.; Australia. Hargitt & Hargitt 1910, p. 231, figs. 11–24: as *C. arctica*; Woods Hole, east coast of U.S.A. Mayer 1910, p. 596, Pl. 65, figs. 3, 4, text-figs. 380, 382: *C. capillata*; arctic, antarctic and temperate regions of all oceans; synonyms: *C. arctica* and *lamarckii* Pèron & Lesueur, *ferruginea* Eschscholtz and *postelsii* Brandt; p. 600, Pl. 66, figs. 1–7, Pl. 67. figs. 1–3: as *C. capillata* var. *fulva*; east coast of U.S.A.; p. 600, Pl. 65, figs. 1, 2: as *C. capillata* var. *versicolor*; east coast of U.S.A.; p. 601: as *C. annaskala*; (Australia). Morse 1910, pp. 544, 545: as *C. arctica*; east coast of U.S.A. Widmark 1911, p. 381, fig. 3. Jordan 1912, p. 131. Bigelow 1913, p. 93, Pl. 4, figs. 8, 9: as *C. capillata* var. *capillata*; N.W. Pacific. Kramp 1913*a*, p. 283: as *C. arctica*; W. Greenland. Le Danois 1913*b*, p. 15: *C. capillata* from Faroes and as *C. arctica* from N. of Iceland. Le Danois 1913*c*, p. 351: *C. capillata* and *arctica*; northern Atlantic. Le Danois 1913*d*, p. 287: as *C. arctica*; Iceland. Robson 1913*b*, pp. 34, 35, Pls. 5–7: abnormal ephyra. Bigelow 1914*b*, p. 28: New England, east coast of U.S.A. Kramp 1914, p. 445: as *C. arctica*; W. and E. Greenland. Mayer 1914*a*, pp. 5, 6, 22: as *C. arctica*; Tortugas, Florida. Bigelow 1915*b*, pp. 316, 318: between Nova Scotia and Chesapeake Bay, U.S.A. Kramp 1915, p. 20: Denmark. Bigelow 1917, p. 303: Gulf of Maine, U.S.A. Stiasny 1919*b*, p. 90: *C. capillata* var. *capillata*; Holland; Bergen, Norway. Bigelow 1920, p. 13: *C. capillata* var. *capillata*; p. 17: as *Cyanea* sp.?; Hudson Bay. Grieg 1921, p. 81: Spitzbergen. Pérez 1921*b*, pp. 168–78: Pas de Calais, English Channel. Schaefer 1921, pp. 49–59: as *Cyanea*; physiology. Elmhirst 1923, p. 22: Clyde Sea, Scotland. Kramp & Damas 1925, p. 239: Norway. Bigelow 1926, p. 357: as *C. cap.* var. *arctica*; Gulf of Maine, U.S.A. Fish 1926, pp. 125, 127: Woods Hole, U.S.A. McIntosh 1926, p. 257: Scotland. Schodduyn 1926, p. 40: Pas de Calais, English Channel. Okada 1927*b*, p. 254, fig. 2: ontogeny. Schodduyn 1927, p. 26. Uchida 1927*b*, p. 230, fig. 5: Mutsu Bay, Japan. Wu 1927, pp. 1–5: China. Stiasny 1930*a*, p. 10, Pl. 1, figs. 1–7: Belgium; Norway. Mar. Biol. Ass. 1931, p. 85: Plymouth. Neppi 1931, pp. 143–9, figs. 1–4: Spitzbergen. Stiasny 1931*a*, p. 140: British coasts. Stiasny 1931*b*, p. 31, fig.: as *C. capillata* var. *annaskala*; Australia. Tu 1931, p. 87: as *Cyanea*; China. Arndt 1932, pp. 160, 333: Nordostseekanal, northern Germany. Bateman 1932, pp. 124–7: osmotic properties of *Cyanea*. Runnström 1932, p. 32:

Norway. BATEMAN 1933, p. 451: as *Cyanea*; water content. KRAMP 1933*b*, p. 16: Angmagssalik, S.E. Greenland. BERNTROP 1934, p. 2084: North Sea coast, Holland. HORSTMANN 1934*a*, pp. 406–20, figs. 1–5: physiology of swimming. HORSTMANN 1934*b*, pp. 421–31, figs. 1–6: physiology. WEILL 1934*b*, p. 535: nematocysts. KÜNNE 1935, p. 66: Baltic Sea. THIEL 1935*a*, p. 3, fig. 2: poisonous effect. KOIZUMI & HOSOI 1936, pp. 710–17: content of inorganic components; Japan. LAMBERT 1936, p. 72, Pl. 3: Essex coast, S. England. LÖNNBERG 1936, pp. 195, 196: Kristineberg, W. coast of Sweden. PAPENFUSS 1936, p. 5, figs. 1, 5, 9, 14, 18: Kristineberg, W. coast of Sweden. KRAMP 1937*b*, p. 176, figs. 76, 78, 79: Denmark. FRASER 1938, p. 92: as *Cyanea* sp.; Queen Charlotte Islands, Pacific coast of Canada. STIASNY 1938, p. 15, Pl. 1, figs. 1, 2: as *Cyanea* sp.; Red Sea. UCHIDA 1938*b*, p. 45: Mutsu Bay, Japan. KRAMP 1939*a*, p. 21: Iceland. UCHIDA 1940*a*, p. 294: Japan. KRAMP 1942, p. 128, figs. 34–6: comparison with *C. arctica*; W. Greenland. MAADEN 1942*a*, pp. 349–51, 354–6, 358: as *C. capillata* incl. *lamarcki*; Holland. MAADEN 1942*b*, pp. 63–70: *C. capillata*, incl. *lamarcki*; Holland. VERWEY 1942, p. 389: Holland. KRAMP 1943, p. 12: E. Greenland. STIASNY & MAADEN 1943, pp. 242, 244, 250: *C. capillata*; synonyms: *C. annaskala, arctica, lamarcki* and *palmstruchii*; p. 252: *C. versicolor* a colour-variety of *C. capillata*. FOX & PANTIN 1944, p. 121: as *Cyanea* sp.; p. 122: *C. capillata*; pigment. RANSON 1945*b*, p. 316: N.W. Europe; Novaja Zemlja; Nova Scotia. RANSON 1945*c*, p. 52, Pl. 1, fig. 7: as *C. arctica*, considered a valid species; Nova Scotia, Canada; p. 53, Pl. 1, fig. 8: *C. capillata*; Norway. USSING 1945, pp. 46–8, fig. 1: Mariagerfjord, Denmark. KRAMP 1947, p. 49: N.E. Atlantic. LELOUP 1947, p. 43: Belgium. MANKOWSKI 1948, p. 110: Gulf of Gdansk, Baltic. YASHNOV 1948, p. 76, Pl. 22, fig. 4: as *Cyanea*; Barents Sea; White Sea. BERRILL 1949*a*, pp. 283–92, figs. 1–3: Atlantic N. of Cape Cod. BERRILL 1949*b*, pp. 393–410. FRASER 1949*b*, p. 66: northern North Sea. POPE 1949, pp. 14–16, two text-figs.: as *C. annaskala*; Sydney. KÄNDLER 1950, p. 68: ephyrae of *Cyanea*; Fehmarnbelt, Baltic. NAIR 1951, p. 73: as *C. annaskala*; Trivandrum coast, India. DEEVEY 1952*a*, p. 65: as *Cyanea*; Block Island Sound, Connecticut, U.S.A. FRASER 1952*b*, p. 104: as *Cyanea*; northern North Sea. YASHNOV 1952, p. 96: off Kamchatka. KÜNNE 1952, pp. 7, 13, 32, 41: S.E. North Sea. SMIDT 1952, p. 95: Danish Waddensea. POPE 1953*a*, pp. 16–21: as *C. annaskala*; Australia. POPE 1953*b*, p. 111: Australia. REES 1953*a*, p. 8: Herdlafjord, Norway. SEGERSTRÅLE 1953, p. 6: inner Baltic. CHIU 1954*b*, p. 56. HEDGPETH 1954, p. 278: as *C. capillata* var. *versicolor*; Gulf of Mexico. NEWELL 1954, p. 330: Kent, England. SOUTHWARD 1954, p. 20: Irish Sea. UCHIDA 1954, pp. 209–19, fig. 2, map: Japan. KRAMP 1955*b*, p. 164: by Haeckel 1880 determined as *Stenoptycha dactylometra* and *C. arctica*. MAC GINITIE 1955, pp. 42, 93–5, 101, 102, 107, 120: breeding season; Point Barrow, Alaska. NAUMOV 1955*c*, pp. 102–4, fig. 2: reproduction. FRASER 1956, p. 27: as *Cyanea*; between Iceland and Faroes. HARTMAN & EMERY 1956, p. 307: California. HORRIDGE 1956*b*, pp. 366–83, figs. 1–8: innervation; Millport, Scotland. NAUMOV 1956*b*, p. 38. BASSINDALE & BARRET 1957, p. 248: Dale Fort, Wales. KAUFMAN 1957, pp. 1317–19, fig. 1: regeneration in scyphistoma. CARTHY 1958, pp. 197, 293: responses to stimuli. PLESSIS 1958, pp. 379–85: French coast of English Channel. THIEL 1958*b*, p. 37. DAHL 1959, pp. 1–8: as host of *Hyperia galba*; Norway. FRASER 1959, pp. 30, 66: southern Iceland; Scotland. GRAINGER 1959, pp. 473, 496, Iglooik, arctic Canada. HORRIDGE 1959, pp. 78–85, figs. 5, 7, 8 (diagrams). KRAMP 1959*b*, p. 24: West Africa; Nova Scotia.

Cyanea citrea Kishinouye 1910 Doubtful species.

Kishinouye 1910, p. 16, Pl. 4, figs. 16, 17: *Cyanea citrea* n.sp.; Japan. Mayer 1910, p. 597: synonym of *C. capillata.* Stiasny & Maaden 1943, p. 246, fig. 10: doubtful species.

Cyanea ferruginea Eschscholtz 1829

Up to 400 mm wide; rhopalar and tentacular stomach pouches completely separated; peripheral canals straight, without anastomoses; colour brownish or yellowish.

Eschscholtz 1829, p. 70, Pl. 5, fig. 1*a*, *b*: *Cyanea ferruginea* n.sp.; northern Pacific. Mayer 1910, p. 596: synonym of *C. capillata.* Stiasny 1919*b*, p. 88: as *C. capillata* var. *ferruginea.* Stiasny & Maaden 1943, p. 247: is provisionally retained, only represented by Eschscholtz's original specimen. Chiu 1954*b*, p. 56.

Cyanea fulva L. Agassiz 1862

Doubtful species.

L. Agassiz 1862, pp. 119, 162: *Cyanea fulva* n.sp. Mayer 1910, p. 600, Pl. 66, figs. 1–7, Pl. 67, figs. 1–3: as *C. capillata* var. *fulva*; (east coast of U.S.A. from Cape Cod to Carolina). Bigelow 1928, p. 520: *C. capillata* var. *fulva*; off New York. Stiasny & Maaden 1943, p. 249: doubtful species.

Cyanea lamarcki Péron & Lesueur 1809

Similar to *C. capillata*, but colour blue; up to 300 mm wide.

Péron & Lesueur 1809, p. 363: *Cyanea lamarcki* n.sp. Mayer 1910, p. 596: synonym of *C. capillata*; (N.W. Europe). Le Danois 1913*d*, p. 287: Bay of Biscay. Stiasny 1919*b*, p. 90: as *C. capillata* var. *lamarcki*; Holland. Kramp & Damas 1925, p. 239: Norway. Schodduyn 1926, p. 40: Pas de Calais, English Channel. Weill 1926*a*, p. 259: nematocysts. Schodduyn 1927, p. 27. Mar. Biol. Ass. 1931, p. 85: Plymouth. Russell 1931*a*, pp. 573–6: Plymouth. Stiasny 1931*a*, p. 140: British coasts. Weill 1934*b*, p. 538: nematocysts. Lambert 1936, p. 73. Lönnberg 1936, pp. 193–5: Kristineberg, W. coast of Sweden. Papenfuss 1936, p. 10, figs. 6. 10, 15, 19: as *C. palmstruchii*; Kristineberg, W. coast of Sweden. Kramp 1937*a*, pp. 163–73, fig. 1: Kattegat, Denmark. Kramp 1937*b*, p. 183: Denmark. Kramp 1939*a*, p. 21: Iceland. Woollard & Harpman 1939*a*, pp. 361–2: nervous system. Woollard & Harpman 1939*b*, pp. 559–62: nervous system. Stiasny 1940*c*, pp. 295–301, fig. 1: as *C. palmstruchii*; Skagerak. Maaden 1942*a*, pp. 349–51, 354–6, 358: as *C. capillata* var. *lamarcki*; Holland. Maaden 1942*b*, pp. 63–70: ? =*C. capillata*; Holland. Verwey 1942, p. 378: Holland. Stiasny & Maaden 1943, p. 244: =*C. capillata.* Ranson 1945*b*, p. 317: as *C. capillata* var. *lamarcki*; Iceland; Copenhagen, Denmark. Künne 1952, pp. 7, 13, 32, 41: S.E. North Sea. Chapman 1953a, pp. 161, 169, fig. 2: physiology of mesogloea; Whitstable, England. Lubet 1954, p. 214: Arcachon, Bay of Biscay.

Cyanea mjöbergi Stiasny 1921

Up to 140 mm wide; rhopalar and tentacular stomach pouches connected by several broad, transverse anastomoses; peripheral canals without anastomoses; radial muscles reaching half-way into the circular muscle band; horseshoe-shaped insertion of tentacle groups almost as broad as long.

STIASNY 1921*c*, p. 3, fig.: as *C. capillata* var. *mjöbergi* nov. var.; W. Australia. STIASNY & MAADEN 1943, p. 256: a valid species, *C. mjöbergi*.

Cyanea muellerianthe Haacke 1887

Doubtful species.

HAACKE 1887, p. 605, Pl. 36, figs. 1–4: *Cyanea muellerianthe* n.sp.; Australia. MAYER 1910, p. 601: synonym of *C. annaskala*. STIASNY 1922*e*, p. 521: *C. muellerianthe*; S.E. Australia. STIASNY & MAADEN 1943, p. 250: doubtful species. SOUTHCOTT 1958, p. 56, fig. 2D: South Australia.

Cyanea nozakii Kishinouye 1891

Up to 260 mm wide; rhopalar and tentacular stomach pouches connected by several broad, transverse anastomoses; peripheral canals with numerous anastomoses, forming a dense network; colour milky white.

KISHINOUYE 1891, three pp., one Pl.: *Cyanea nozakii* n.sp.; Japan. MAYER 1910, p. 601: as *C. capillata* var. *nozakii*. BIGELOW 1913, p. 93, Pl. 4, figs. 5–7: as *C. capillata* var. *nozakii*; N.W. Pacific. STIASNY 1919*b*, p. 89: as *C. capillata* var. *nozakii*. RAO 1931*a*, p. 32, figs. 1–3: as *C. capillata* var. *nozakii*; Mergui Archipelago, Indian Ocean. STIASNY & MAADEN 1943, p. 257: *C. nozakii* a valid species. RANSON 1945*b*, p. 317: Indochina. UCHIDA 1954, pp. 209–19, fig. 2, map: Japan. YAMAZI 1958, p. 139: Tanabe Bay, Japan.

Cyanea postelsi Brandt 1838

Doubtful species.

BRANDT 1838*a*, p. 375, Pls. 12, 13, 13*a*: *Cyanea postelsii* n.sp.; Aleutian Islands, North Pacific. MAYER 1910, p. 597: a variety of *C. capillata*. STIASNY & MAADEN 1943, p. 251: doubtful species.

Cyanea purpurea Kishinouye 1910

Up to 300 mm wide; rhopalar and tentacular stomach pouches completely separated; peripheral canals with numerous anastomoses; colour violet with reddish mouth-arms.

KISHINOUYE 1910, p. 18, Pl. 4, figs. 18, 19: *Cyanea purpurea* n.sp.; Saghalin, N. of Japan. MAYER 1910, p. 601: ? =*C. annaskala*. STIASNY & MAADEN 1943, p. 251, fig. 11: a valid species. NAIR 1946, p. 97: Travancore coast, India. UCHIDA 1954, pp. 209–19: Japan.

Cyanea rosea Quoy & Gaimard 1824

Doubtful species.

QUOY & GAIMARD 1824, p. 570, Pl. 85, figs. 1, 2: *Cyanea rosea* n.sp.; Great Barrier Reef, Australia. MAYER 1910, p. 601: ? =young medusa of *C. annaskala*. STIASNY & MAADEN 1943, p. 252: doubtful species.

Genus **Desmonema** L. Agassiz 1862

Cyaneidae with eight rhopalia and with eight adradial clusters of tentacles; no radial muscle strands in the subumbrella.

Type-species: *D. gaudichaudi* L. Agassiz.

L. Agassiz 1862, p. 166: *Desmonema* n.g. Mayer 1910, p. 591.

Desmonema chierchianum Vanhöffen 1888

About 300 mm wide; numerous narrow canals in the lappets, branching towards both sides; with long and thin tentacles in several rows in each cluster.

Vanhöffen 1888, p. 18, Pl. 1, fig. 4: *Desmonema chierchiana* n.sp.; Antarctic. Browne 1910, pp. 48 ff., Pl. 5, fig. 2: non *D. gaudichaudi*. Mayer 1910, p. 593, text-figs. 377–9. Stiasny 1934*a*, p. 390, fig. 11: W. of Falkland Islands. Stiasny & Maaden 1943, pp. 260–4: revision; survey of distribution: Puntas Arenas; Falkland Islands; between Falkland Islands and Patagonia. Kramp 1957*c*, p. 3: Heard Island and Campbell Island, subantarctic.

Desmonema gaudichaudi (Lesson 1830)

500–600 mm wide; with only 5–7 tentacles in a single line in each cluster; few broad canals in the lappets, the lateral ones unilaterally branched.

Lesson 1830, p. 114, Pl. 13, fig. 1: as *Chrysaora gaudichaudii* n.sp.; Antarctic. L. Agassiz 1862, p. 166: *Desmonema gaudichaudi* n.g. Browne 1910, p. 49, Pl. 5, fig. 1: different from *D. chierchiana*; Cape Adare, Antarctic. Mayer 1910, p. 593, text-fig. 376. Stiasny 1931*a*, p. 139: Cape Adare, Antarctic. Stiasny 1934*a*, p. 389, fig. 10: South Georgia. Stiasny & Maaden 1943, pp. 260–4: revision; survey of distribution: Cape Adare; Falkland Islands; South Georgia. Kramp 1957*c*, p. 3: distinct from *D. chierchiana*.

Genus **Drymonema** Haeckel 1880

Cyaneidae with eight rhopalia; tentacles not grouped in isolated clusters, but arising from a wide zone in the subumbrella.

Type-species: *D. dalmatinum* Haeckel.

Haeckel 1880, p. 633: *Drymonema* n.g. Mayer 1910, p. 603.

Drymonema dalmatinum Haeckel 1880

500–1000 mm wide; numerous (144) radial furrows on exumbrella, and between them same number of marginal lappets; the 16 stomach pouches terminate in 164–176 dichotomous ramuli: 8 × 2 rhopalar and 144–160 velar terminal canals; mouth-arms about half as long as diameter of umbrella; the numerous tentacles arise from the middle zone of the subumbrella; eight sense-organs in deep niches.

HAECKEL 1880, p. 642: *Drymonema dalmatina* n.g., n.sp.: Dalmatian coast of Adriatic Sea. HAECKEL 1881, p. 125, Pls. 30, 31: as *D. victoria* n.sp.; Straits of Gibraltar. MAYER 1910, p. 603, text-figs. 383, 384: (Mediterranean). STIASNY 1931*a*, p. 140: as *D. victoria*; Adriatic Sea. KOLOSVÁRY 1937, pp. 1–3, fig.: Adriatic Sea. STIASNY 1940*b*, pp. 14–18, fig. 1: Adriatic Sea. STIASNY 1940*d*, pp. 437–62, Pl. 4, text-figs. 1–8: description; Adriatic Sea. KOLOSVÁRY 1945, p. 140: Rovigno, Adriatic Sea. KRAMP 1959*b*, p. 25: Angola, West Africa.

Drymonema gorgo F. Müller 1883

About 300 mm wide; the 16 stomach pouches terminate in 176 dichotomous ramuli: 8×2 rhopalar and 8×20 velar terminal canals; mouth-arms longer than diameter of umbrella.

F. MÜLLER 1883, p. 220: *Drymonema gorgo* n.sp.; coast of Brazi'. MAYER 1910, p. 604: a variety of *D. dalmatina*? STIASNY 1940*d*, pp. 439, 459. VANNUCCI 1957*a*, pp. 594–6.

Family *ULMARIDAE*

Semaeostomeae with simple or branched radial canals and a ring-canal; with or without subgenital pits.

Subfamily *AURELIINAE*

Ulmaridae in which the tentacles and lappets arise from the sides of the exumbrella above the margin; invaginated gonads with external subgenital pits.

Genus ***Aurelia*** Péron & Lesueur 1809

Aureliinae with four unbranched mouth-arms; bell margin divided into eight or 16 broad velar lobes; some or all radial canals give rise to anastomosing branches.

Type-species: *A. aurita* (Linné).

PÉRON & LESUEUR 1809, p. 357: *Aurellia* n.g. LAMARCK 1816, p. 513: *Aurelia*. MAYER 1910, p. 619: *Aurellia*. REES 1957*a*, pp. 26–8: proposed validation of the generic name *Aurelia*. (Now validated.) THIEL 1958*b*, pp. 37–54: discussion on alternation of generations.

Aurelia aurita (Linné 1758)

Up to about 400 mm wide, with eight broad, simple marginal lappets; mouth-arms as long as radius of disk, thick, stiff, with densely crenulated margins and numerous small tentacles; rhopalar and adradial canals unbranched, the other canals branched, slender, anastomoses more numerous in American than in European specimens; sense-organs in shallow clefts; tentacles small; colour variable.

LINNÉ 1758, p. 660: as *Medusa aurita* n.sp. PÉRON & LESUEUR 1809, p. 359: as *Aurellia flavidula*. LAMARCK 1816, p. 513: *Aurelia aurita*. HARGITT & HARGITT 1910, p. 237, figs. 25–48: as *Aurelia flavidula*; Woods Hole, east coast of U.S.A. MAYER 1910, p. 623, Pl. 67, fig. 4, Pl. 68, figs. 1–4, text-fig. 397: *Aurellia aurita*; list of synonyms; northern Atlantic; p. 627: as *Aurellia aurita* forma '*marginalis*'; (east coast of U.S.A.); p. 627: as '*Aurellia dubia*' Vanhöffen; (Gulf of Iran). MCINTOSH 1910, pp. 125–43, figs. 1–4: Clyde, Scotland. MORSE 1910, pp. 544, 545: as *A. flavidula*; physiology. MCINTOSH 1911, pp. 25–9: Clyde, Scotland. WIDMARK 1911, p. 378, figs. 1, 2: as *Aurellia aurita*. BIGELOW 1913, p. 99: N.W. Pacific. LE DANOIS 1913*d*, p. 288: Bay of Biscay; Faroes; Iceland. VANHÖFFEN 1913*a*, p. 429: West Indies. WIDMARK 1913, pp. 33–48, figs. 1–4: Kristineberg, west coast of Sweden. BIGELOW 1914*b*, p. 28: New England. MAYER 1914*a*, pp. 4–6, 16–18, 22: *Aurellia aurita*; Florida. BIGELOW 1915*b*, p. 316: *Aurellia aurita*; Gulf of Maine, east coast of U.S.A. KRAMP 1915, p. 20: Denmark. MAYER 1915*a*, p. 182: *Aurellia aurita*; Philippines. INT. PLANKT. CATAL 1916, p 45: English Channel; Baltic Sea. BIGELOW 1917, p. 303: Gulf of Maine, U.S.A. MAYER 1917*a*, p. 204: *Aurellia aurita*; Philippines. NEPPI 1919, p. 124: abnormal specimen; Naples, Italy. STIASNY 1919*b*, p. 95: Holland; as *A. flavidula*; Venezuela. GEMMILL 1921*b*, p. 222, figs. 1, 2: food-capture and ciliation in ephyrae. GRIEG 1921, p. 81: does not occur at Spitzbergen. LOW 1921, pp. 226–35, figs. 1–13: Cullercoats, England. ORTON 1922, pp. 178, 179: mode of feeding. STIASNY 1922*e*, p. 522: *Aurelia* sp.; Philippines. STIASNY 1922 ff., p. 83: Curaçao, West Indies. ELMHIRST 1923, p. 22: Clyde Sea, Scotland. LEBOUR 1923, p. 71: Plymouth. PERCIVAL 1923, pp. 85–100, Pl. 6, text-figs. 1–3: *Aurelia*; strobilization. DE BEER & HUXLEY 1924, p. 471: dedifferentiation in *Aurelia*. KRAMP & DAMAS 1925, p. 239: Norway. WIKSTRÖM 1925*a*, pp. 209, 210, 228: Baltic Sea. WIKSTRÖM 1925*b*, pp. 244–6: Baltic Sea. BIGELOW 1926, p. 362: Gulf of Maine, U.S.A. FISH 1926, pp. 125, 126: as *A. flavidula*; Woods Hole, east coast of U.S.A. MCINTOSH 1926, p. 256: Scotland. SCHODDUYN 1926, p. 40: Pas de Calais, English Channel. STIASNY 1926*a*, p. 244: Philippines. WETOCHIN 1926, pp. 107–20, figs. 1–3: physiology. OKADA 1927*b*, p. 259, fig. 6: histology. USSING 1927, pp. 91–106, figs. 1–6: Mariagerfjord, Denmark. UCHIDA 1928*a*, p. 375: Japan. STIASNY 1930*a*, p. 22, Pl. 2, figs. 8, 9: Belgium. MAR. BIOL. ASS. 1931, p. 85: *Aurellia aurita*; Plymouth. RAO 1931*a*, p. 36: Andaman Islands, Indian Ocean. STIASNY 1931*a*, p. 140: British coasts. TU 1931, p. 87: Gulf of Korea. ARNDT 1932, pp. 160, 333: Nordostseekanal, northern Germany. RUNNSTRÖM 1932, p. 31: Norway. WIKSTRÖM 1932, p. 14: Baltic. BATEMAN 1933, p. 451: *Aurelia*; water content. BENAZZI 1933, p. 212. BOGUCKI 1933, pp. 117–19: Baltic. DEMEL 1933, p. 123: Baltic. HALISCH 1933, pp. 296–304, figs. 1–10: scyphistoma. HUMMELINCK 1933, pp. 453, 454: Bonaire, West Indies. BERNTROP 1934, p. 2084: Holland. HORSTMANN 1934*a*, pp. 406–20: physiology. HORSTMANN 1934*b*, pp. 421–31: physiology. STEINER 1934, pp. 102–5, five text-figs.: physiology. WEILL 1934*b*, p. 543: nematocysts. KÜNNE 1935, p. 66: Baltic. STEINER 1935, pp. 176–81, five figs.: physiology. THIEL 1935*a*, p. 3, fig. 1: poisonous effect. KOIZUMI & HOSOI 1936, pp. 709–19: as *A. flavidula*; inorganic decomposition. LAMBERT 1936, p. 71, Pls. 3, 4: Essex coast, S. England. LÖNNBERG 1936, pp. 196, 197: Kristineberg, west coast of Sweden. GILCHRIST 1937, p. 143: *Aurelia*; scyphistoma. KRAMP 1937*b*, p. 184, figs. 77, 80–2: Denmark. THILL 1937, pp.

51–96. Bigelow 1938, p. 168: *Aurellia aurita*; Bermudas. Fraser 1938, p. 92: as *Aurelia* sp.; Queen Charlotte Islands, Canada. Uchida 1938*a*, p. 148: Japan. Buhk 1939, pp. 433–5, figs. 1–6. Kramp 1939*a*, p. 22: Iceland. Maaden 1939, p. 29, one text-fig.: sense-organs. Netchaeff & Neu 1940, p. 61: Bosporus; Bulgarian coast. Stiasny 1940*a*, p. 22: the Azores; tropical Indo-Pacific. Komai 1942, p. 28: physiology; Japan. Kramp 1942, pp. 125–8, figs. 29, 30, 33, map: *A. aurita* var. *occidentalis* (*A. flavidula*) nov. var.; W. Greenland. Lowndes 1942, p. 234: water content. Maaden 1942*a*, pp. 347–62: Holland. Verwey 1942, p. 394: *Aurellia aurita*; Holland. Hyman 1943, p. 140: water content. Lowndes 1943, p. 226: water content. Fox & Pantin 1944, p. 121: *Aurelia* sp.; pigment. Khalaf El-Duweini 1945, p. 337: Red Sea. Kolosváry 1945, p. 139: Rovigno, Adriatic Sea. Ranson 1945*b*, p. 317: Faroes; Scotland; Norway; Denmark; Baltic Sea; English Channel; French Mediterranean coast; Red Sea; Gulf of Bengal. Ranson 1945*c*, p. 65: discussion of species; Nova Scotia. Cutcliff 1946, p. 171: *Aurellia aurita*; England. Kramp 1947, p. 48: N.E. Atlantic. Leloup 1947, p. 43: Belgium. Ussing 1947, pp. 95–9, fig. 1: Mariagerfjord, Denmark. Fraser 1948, p. 43: Scotland. Mankowski 1948, p. 110: Gulf of Gdansk, Baltic. Yashnov 1948, p. 76, Pl. 22, fig. 3*a*, *b*: Barents Sea; White Sea. Berrill 1949*b*, pp. 393–409: development. Purasjoki 1949, p. 100: Gulf of Finland. Ranson 1949, p. 144: description; Martinique, West Indies. Southward 1949, p. 536: ciliation. Fraser 1950, p. 93: *Aurelia*; Faroe area. Hägg 1950, pp. 165, 259: Baltic. Kändler 1950, p. 68: ephyrae; Fehmarnbelt, Baltic. Wiedemann 1950, p. 186, fig. 1: physiology. Anon 1951, p. 805: *Aurelia*; British coasts. Child 1951, pp. 178–85, figs. 1–13: discussion and comparison with *Haliclystus* and *Corymorpha*; California. Franc 1951, p. 28: English Channel. Fraser 1951*a*, p. 25: Faroe area. Gotto 1951, p. 163: Ireland. Hela 1951, pp. 71–8, fig. 1: Baltic. Hollowday 1951, pp. 193–8, figs. 1–11: development (scyphistoma-stage called *Hydratuba*); English Channel. Fraser 1952*a*, p. 35: from Scotland to Faroes. Künne 1952, pp. 14, 42: S.E. North Sea. Pantin & Dias 1952, pp. 351–64: rhythmic activity and responses. Smidt 1952, p. 95: Danish Waddensea. Chapman 1953*a*, pp. 159, 169, fig. 1: physiology of mesogloea; Whitstable, England. Fraser 1953, p. 33: Faroe area. Horridge 1953, p. 400, one fig.: *Aurellia aurita*; physiology. Rees 1953*a*, p. 8: Herdlafjord, Norway. Segerstråle 1953, p. 6: Inner Baltic. Chiu 1954*b*, p. 56: as *Aurellia aurita*. Fraser 1954*b*, p. 101: *Aurelia*; Scotland. Hedgpeth 1954, p. 278: *Aurellia aurita*; Gulf of Mexico. Horridge 1954*a*, p. 594, figs. 1–4: *Aurellia aurita*; nerve conduction; Millport, Scotland. Horridge 1954*b*, p. 85, figs. 3, 4: *Aurellia aurita*; physiology. Hummelinck 1954, p. 166: *Aurellia aurita*; no longer occurs in Zuiderzee, Holland. Lubet 1954, p. 214: Arcachon, Bay of Biscay. Newell 1954, p. 330: Kent, England. Palmér 1954, pp. 122–31: Gulf of Finland. Southward 1954, p. 20: Irish Sea. Uchida 1954, pp. 209–19, fig. 2: Japan. Kramp 1955*a*, p. 300: Gulf of Guinea, W. Africa. Mac Ginitie 1955, pp. 107, 120: as *Aurelia* sp.; Point Barrow, Alaska. Naumov 1955*c*, pp. 102–4, figs. 1, 3, 4. Southward 1955, pp. 201–16, figs. 1–7: ciliary currents and mode of feeding; Irish Sea; English Channel. Uchida 1955*a*, p. 15: Riu-kiu Islands and Formosa, W. Pacific. Forsmann 1956, p. 17: Baltic. Hartman & Emery 1956, p. 307: California. Horridge 1956*a*, pp. 59–74, figs. 1–9: *Aurellia aurita*; nervous system of ephyrae. Horridge 1956*b*, p. 380: innervation. Hüsing 1956, pp. 479–81: nutrition. Naumov 1956*b*, p. 38. Bassindale & Barret 1957, p. 248: Dale Fort, Wales. Bouillon & Vandermeerssche 1957, pp. 9–25, fig. 7: histology of mesogloea. Rees 1957*a*, pp. 26–8: historic review of the name *Aurelia*, *Aurelia* proposed to be validated, *Aurellia* Pér. & Les. proposed to be suppressed. Searle 1957, p. 73, fig. 3: Singapore. SEGERSTRÅLE 1957, pp. 777, 778: Baltic. VALKANOV 1957, p. 17: Black Sea. VANNUCCI 1957*a*, pp. 594–6: (Brazil). VANNUCCI 1957*c*, p. 326, fig. 1: double monster ephyrae; Brazil. VUČETIC 1957, p. 37: rock pools, Mljet Island, Adriatic Sea. CARTHY 1958, pp. 197, 293: responses to stimuli. HALME 1958, p. 44: Baltic coast of Finland. PAUL 1958, p. 535: Eastbourne, Maine, U.S.A. SOUTHCOTT 1958, p. 58, fig. 2A: South Australia. THIEL 1958*a*, pp. 13–26, figs. 1–4: growth and reproduction. THIEL 1958*b*, p. 45. UCHIDA 1958, p. 164: Sado, Japan. YAMAZI 1958, p. 139: as *Aurellia aurita*; Tanabe Bay, Japan. DAHL 1959, pp. 1–8: as host of *Hyperia galba*; Norway. HORRIDGE 1959, pp. 72–91, figs. 1, 2, 3, 6, 9 (diagrams): rhythm. LINDQUIST 1959, p. 45: Gulf of Bothnia, Baltic Sea. KRAMP 1959*b*, p. 24: West Africa. MAADEN 1959, pp. 5–7, fig. 1: Gulf of Aqaba, Red Sea.

Aurelia coerulea von Lendenfeld 1884

Up to 210 mm wide, with eight broad marginal lobes without or with faintly indicated adradial depressions; mouth-arms very broad and only faintly crenulated, their base with many broad, flat folds, cauliflower-like; rhopalar and adradial canals unbranched, the other canals branched with anastomoses; tentacles remarkably long.

VON LENDENFELD 1884*c*, p. 280: *Aurelia coerulea* n.sp.; Australia. MAYER 1910, pp. 620, 623: as *Aurellia aurita* var. *coerulea*, – var. *colpota*. STIASNY 1924*c*, p. 69, fig. 6: *A. coerulea*; Sydney, Australia. STIASNY 1931*b*, p. 40: Australia. DAKIN & COLEFAX 1933, p. 198: New South Wales, Australia.

Aurelia colpota Brandt 1838

Up to 170 mm wide, with eight broad, marginal lobes slightly notched centrally; branching of the canals mainly in their distal portions; mouth-arms long and broad, much folded and lobed throughout their length, with a deep incision at their base; colour: tentacles and gonads rose-red.

BRANDT 1838*a*, p. 370, Pl. 9: *Aurelia colpota* n.sp., described as a doubtful species; South Africa. MAYER 1910, pp. 620, 623: as *Aurellia aurita* var. *colpota*, = var. *coerulea*; (Indian Ocean to Pacific). STIASNY 1919*b*, p. 91: as *A. aurita* var. *colpota*; Malay Archipelago. STIASNY 1926*a*, p. 244: as *A. aurita* var. *colpota*; Philippines.

Aurelia labiata Chamisso & Eysenhardt 1821

Up to 300 mm wide, with 16 marginal lobes divided by more or less deep median clefts; canal system similar to *A. aurita*, with many anastomoses; mouth-arms fairly short, thick, pyramidal, somewhat folded; subgenital ostia small; colour: yellowish or light violet.

CHAMISSO & EYSENHARDT 1821, p. 358, Pl. 28, figs. 1A, B: *Aurelia labiata* n.sp. MAYER 1910, p. 628, text-fig. 398: *A. labiata*, incl. *limbata* Brandt; (Pacific); Philippines. BIGELOW 1913, p. 98: remarks on marginal lappets. LIGHT 1914*b*, p. 200: Philippines. MAYER 1915*a*, pp. 160, 182: Torres Strait; Philippines. MAYER 1917*a*, p. 205, fig. 11: Philippines. STIASNY 1919*b*, p. 93: Malay Archipelago. LIGHT 1921, p. 31: Philippines. STIASNY 1926*a*, p. 244: as *A. aurita* var. *labiata*; Philippines. UCHIDA 1928*a*, p. 374, fig. 1: five-rayed specimen; Japan. STIASNY 1931*a*, p. 140. STIASNY 1935, p. 34: Malay Archipelago. STIASNY 1937*b*, p. 207. RANSON 1945*c*, pp. 60, 61. CHU & CUTRESS 1954, p. 9: cause of dermatitis; Hawaii.

Aurelia limbata (Brandt 1838)

Up to about 150 mm wide, with eight broad marginal lobes, in certain states of contraction with 16 clefts, especially in living specimens; all canals except the eight adradial much and profusely branched, with numerous lateral diverticula, forming numerous anastomoses; disk yellow, margin brown.

BRANDT 1838*a*, p. 372, Pl. 10: as *Diplocraspedon limbata* n.sp.; N.W. Pacific. GOETTE 1886, p. 836: *Aurelia limbata*. KISHINOUYE 1910, p. 22: Japan; Saghalin. MAYER 1910, p. 628: synonym of *A. labiata*. BIGELOW 1913, p. 99, Pl. 5, figs. 1–4: N.W. Pacific. KRAMP 1913*a*, p. 280, figs. 3, 4: as *A. flavidula*; W. Greenland. KRAMP 1914, p. 447: as *A. flavidula*; W. Greenland. BIGELOW 1920, pp. 14–17: Alaska; Labrador. STIASNY 1922*e*, p. 522: Vancouver, Pacific coast of Canada. UCHIDA 1934*c*, pp. 698–700, figs. 1, 2: Japan. UCHIDA 1940*a*, p. 294: Japan. KRAMP 1942, pp. 122–5, figs. 28, 31, 32, map: W. Greenland; remarks. STIASNY & MAADEN 1943, p. 234: Sea of Okhotsk; Sea of Kamchatka. RANSON 1945*c*, pp. 60–3: discussion. CHIU 1954*b*, p. 56. UCHIDA 1954, pp. 209–19, fig. 2, map: Japan. KRAMP 1955*b*, p. 164: by Haeckel 1880 determined as *A. flavidula*. NAUMOV 1956*b*, p. 38.

Aurelia maldivensis Bigelow 1904

Up to 250 mm wide; the eight wide marginal lobes each with a very slight central depression; the eight rhopalar and the eight adradial canals unbranched, the other canals branched with occasional anastomoses; mouth-arms large, curtain-like, lips complexly folded, with numerous short tentacles; colour: violet.

BIGELOW 1904, p. 261, Pls. 6, 8, text-figs. 22, 23, 27: *Aurelia maldivensis* n.sp.; Maldive Islands, Indian Ocean. MAYER 1910, p. 629, text-fig. 399: *Aurellia maldivensis*. ?STIASNY 1919*b*, p. 92, Pl. 3, figs. 11, 12: as ?*A. maldivensis*; Malay Archipelago. STIASNY 1935, p. 32, Pl. 1, fig. 3, text-fig. 8: Red Sea. STIASNY 1937*a*, p. 227: Arabian Sea. STIASNY 1937*b*, p. 206. RANSON 1945*b*, p. 317: Indochina. RANSON 1945*c*, pp. 60–4.

Aurelia solida Browne 1905

Up to about 105 mm wide, hemispherical, jelly very thick and unusually solid; eight simple marginal lobes; canals slender, with few anastomoses; mouth-arms like thin, narrow ribbands, their margins slightly folded in proximal portions; the sub-genital cavities large, the ostia very small; each marginal sense-club arises from the inner end of a very deep groove and points upward towards the exumbrella.

BROWNE 1905*a*, p. 960, Pl. 94, figs. 1, 2: *Aurelia solida* n.sp.: Maldive Islands, Indian Ocean. MAAS 1909, p. 45: the Azores. MAYER 1910, p. 627: *Aurellia solida*; Madeira Island. BROCH 1914, p. 22: S. of the Azores. RAO 1931*a*, p. 38: Maldive Islands, Indian Ocean. GRAVELY 1941, p. 12: Madras, India. RANSON 1945*b*, p. 317: Atlantic W. of N. Africa. RANSON 1945*c*, p. 65: the Azores. NAIR 1951, p. 73: Trivandrum coast, India.

Aurelia spp.

STIASNY 1938, p. 15, Pl. 1, fig. 3: *Aurelia* sp.; Red Sea. GEORGE 1953, p. 82: *Aurelia* sp.; Calicut, southern India.

Genus ***Aurosa*** Haeckel 1880

Aureliinae with four bifurcated mouth-arms.

Type-species: *A. furcata* Haeckel.

HAECKEL 1880, p. 559: *Aurosa* n.g.

Aurosa furcata Haeckel 1880

80 mm wide; eight velar lappets, eight sense-organs; four horse-shoe-shaped gonads; 24 radial canals, all with anastomosing side-branches; mouth-arms folded, bifurcated; tentacles numerous, small.

HAECKEL 1880, p. 559, Pl. 33, figs. 7, 8: *Aurosa furcata* n.g., n.sp.; near Cocos Island, Indian Ocean. MAYER 1910, p. 630, text-fig. 400.

Subfamily *STHENONIINAE*

Ulmaridae in which the tentacles arise in linear clusters from the subumbrella; with protrusive sac-like gonads; without subgenital pits.

Genus ***Phacellophora*** Brandt 1835

Sthenoniinae with 16 rhopalia alternating with 16 clusters of tentacles; radial canals in the rhopalar radii branched, in the tentacular radii simple; four gonads.

Type-species: *P. camtschatica* Brandt.

BRANDT, 1835, p. 224: *Phacellophora* n.g. HAECKEL 1880, p. 549. MAYER 1910, p. 612.

Phacellophora camtschatica Brandt 1838

Up to 500–600 mm wide; 16 wide, simple velar lappets containing 5–8 simple, blindly-ending centrifugal canals; tentacles in 16 clusters arising in a single row below the ring canal, each group curved with the concavity outwards.

BRANDT 1838*a*, p. 366, Pl. 8: *Phacellophora camtschatica* n.g., n.sp.; Kamchatka; p. 380, Pls. 27, 28: as *Haccaedecomma ambiguum* n.sp.; Pacific coast of N. America. VERRILL 1869, p. 117: as *Callinema ornata* n.sp.; east coast of U.S.A. HAECKEL 1880, p. 549: *P. camtschatica*; p. 550: as *P. ambigua* (Brandt); p. 551: as *P. sicula* n.sp.; Messina, Italy; p. 643: as *P. ornata* (Verrill). KISHINOUYE 1910, p. 21, fig. 2:

as *P. ambigua*?; Japan; Kuriles. MAYER 1910, p. 613: *P. camtschatica*; (Kamchatka; San Francisco); p. 613, text-fig. 392: as *P. sicula*; Naples, Italy; p. 615, text-fig. 393: as *P. ambigua*; p. 616, text-figs. 394, 395: as *P. ornata*; (east of Montevideo, Uruguay). BIGELOW 1913, p. 96, Pl. 4, fig. 10, Pl. 5, fig. 5: as *P. ambigua*; synonyms: *P. ornata, sicula, ?camtschatica*; Bering Sea. BIGELOW 1914*b*, p. 28: as *P. ornata*; Gulf of Maine. MYERS 1919, p. 120: content of organic material. BIGELOW 1926, p. 364: as *P. ornata*; Gulf of Maine, U.S.A. STIASNY 1934*a*, p. 391, Pl. 15, fig. 6, text-fig. 12: as *P. ornata*; Angola, W. Africa. FEDELE 1937, pp. 195, 257, figs. 1–4: revision of the genus; only one species, *P. camtschatica*; Naples, Italy. FEDELE 1938, pp. 133–5: *P. camtschatica* and *P.* sp.; Naples. ?KRAMP 1939*a*, p. 22: as ?*P. ornata*; S.E. Iceland. STIASNY 1940*a*, p. 22, Pl. 1, fig. 1: Cape Verde Islands. UCHIDA 1947*b*, p. 342: as *P. ambigua*; Japan. KRAMP 1948*b*, p. 22: as *P. ambigua*; northern Atlantic. KRAMP 1952, p. 11, figs. 6, 7, map: Chile. CHIU 1954*b*, p. 56. UCHIDA 1954, pp. 209–19: as *P. ambigua*; Japan. KRAMP 1955*a*, p. 302: *P. camtschatica* the only species; Gulf of Guinea, W. Africa; p. 309: =*P. ornata* from Angola, report of Stiasny 1934. NAUMOV 1956*b*, p. 38: as *P. ambigua*.

Genus ***Poralia*** Vanhöffen 1902

Sthenoniinae with 16 rhopalia; numerous straight, unbranched radial canals; numerous gonads in a ring around the stomach margin.

Type-species: *P. rufescens* Vanhöffen.

VANHÖFFEN 1902, p. 40: *Poralia* n.g. MAYER 1910, p. 617.

Poralia rufescens Vanhöffen 1902

Up to about 250 mm wide; margin wavy, with 16 deep clefts for the rhopalia; the ring canal gives rise to one or two blindly-ending diverticula in each of the inter-rhopalar spaces; about 40 simple radial canals; gonads an almost continuous ring around the periphery of the stomach; tentacles?

VANHÖFFEN 1902, p. 41, Pl. 4, figs. 15, 16: *Poralia rufescens* n.g., n.sp.; Indian Ocean. MAYER 1910, p. 617, text-fig. 396: (eastern tropical Pacific). BROCH 1914, p. 22: northern Atlantic. ?BIGELOW 1938, p. 165: ?*P. rufescens*; Bermudas. RANSON 1945*c*, p. 53, Pl. 2, figs. 10, 11: the Azores.

Genus ***Sthenonia*** Eschscholtz 1829

Sthenoniinae with eight rhopalia; eight adradial linear clusters of tentacles; perradial and interradial canals branched; adradial canals some simple and some branched.

Type-species: *S. albida* Eschscholtz.

ESCHSCHOLTZ 1829, p. 59: *Sthenonia* n.g. MAYER 1910, p. 611.

Sthenonia albida Eschscholtz 1829

About 300 mm wide, disk-shaped; stomach small; a simple and a forked canal arise in each of the eight radii of the velar lappets; these radial canals anastomose to some extent; the eight adradial rows of tentacles are somewhat shorter than the intervals between them.

ESCHSCHOLTZ 1829, p. 59, Pl. 4: *Sthenonia albida* n.g., n.sp.; Kamchatka. MAYER 1910, p. 611, text-fig. 391.

Subfamily *ULMARINAE*

Ulmaridae in which the tentacles arise from the clefts between the marginal lappets; with protrusive, sac-like gonads; without subgenital pits.

Genus ***Diplulmaris*** Maas 1908

Ulmarinae with 16 rhopalia, 16 tentacles and 64 lappets; 16 rhopalar canals branched, 16 tentacular canals simple.

Type-species: *D. antarctica* Maas.

MAAS 1908, p. 9: *Diplulmaris* n.g. VANHÖFFEN 1908*b*, p. 45: as *Ulmaropsis* n.g. MAYER 1910, p. 609.

Diplulmaris antarctica Maas 1908

42 mm wide; marginal lappets pointed; tentacular canals as broad as rhopalar canals; canals without anastomoses.

MAAS 1908, p. 12, one Pl.: *Diplulmaris antarctica* n.g., n.sp.; Antarctic. VANHÖFFEN 1908*b*, p. 45, figs. 10–12: as *Ulmaropsis drygalskii* n.g., n.sp.; Antarctic. BROWNE 1910, p. 52, Pl. 6, figs. 1–6: ?*D. antarctica*; McMurdo Sound and Cape Adare, Antarctic. MAYER 1910, p. 610, text-fig. 390. STIASNY 1931*a*, p. 140.

Diplulmaris malayensis Stiasny 1935

About 30 mm wide; exumbrella with numerous warts; marginal lappets broad and flat; tentacular canals narrower than rhopalar canals, with a marginal network of anastomoses.

STIASNY 1935, p. 24, Pl. 1, fig. 4, text-figs. 3–7: *Diplulmaris malayensis* n.sp.; Malay Archipelago. STIASNY 1937*b*, p. 206.

Genus ***Discomedusa*** Claus 1877

Ulmarinae with eight rhopalia, 24 tentacles, 32 lappets; the eight perradial and interradial canals branched, the eight adradial canals simple.

Type-species: *D. lobata* Claus.

CLAUS 1877, p. 42: *Discomedusa* n.g. HAECKEL 1880, p. 545: as *Umbrosa* n.g. MAYER 1910, p. 606: synonyms: *Umbrosa* and *Ulmaris* Haeckel.

Discomedusa lobata Claus 1877

150 mm wide, disk-shaped; the 16 rhopalar lappets are as wide as, but

somewhat longer than, the 16 tentacular lappets, without centrifugal canals; the terminal ramifications of the perradial and interradial canals fuse with the adradial canals.

CLAUS 1877, p. 42, Pls. 8, 9: *Discomedusa lobata* n.g., n.sp.; Adriatic Sea. HAECKEL 1880, p. 546: as *Umbrosa lobata*. MAYER 1910, p. 607: synonym: *Ulmaris prototypus* Haeckel. RUSSELL 1937, p. 683: English Channel. RUSSELL 1938*c*, p. 497: English Channel. RANSON 1945*b*, p. 317: as *Umbrosa lobata*; Banyuls, French Mediterranean coast. KRAMP 1955*a*, p. 301: Gulf of Guinea. KRAMP 1959*b*, p. 24: West Africa.

Discomedusa philippina Mayer 1910

About 30 mm wide, exumbrella with numerous prominent warts; the 32 marginal lappets oval and all alike and each with two centrifugal, blind canals; the perradial and interradial canals terminate in a network of anastomosing vessels, which fuse with the ring canal, but not with the adradial, simple canals.

MAYER 1910, p. 607, text-fig. 388: *Discomedusa philippina* n.sp.; Philippines. MAYER 1915*a*, p. 181: ? =*Parumbrosa polylobata* Kishinouye. MAYER 1917*a*, p. 203, fig. 10: Philippines.

Discomedusa sp. Moore 1949

MOORE 1949, p. 11: *Discomedusa* sp.; Bermudas.

Genus ***Floresca*** Haeckel 1880

Ulmarinae with eight rhopalia; 32 marginal lappets, 24 tentacles; 16 simple unbranched radial canals, joined by a marginal ring canal.

Type-species: *F. parthenia* Haeckel.

HAECKEL 1880, pp. 537, 538, 643: *Floscula* n.g. and *Floresca* n.g. MAYER 1910, p. 605.

Floresca parthenia Haeckel 1880

50 mm wide, 30 mm high, with a 16-rayed pigmented, star-like marking on the exumbrella; four interradial crescentic gonads, lined on their inner, concave sides by a row of gastric cirri.

HAECKEL 1880, p. 537, Pl. 32, figs. 1–4: as *Floscula promethea* n.g., n.sp.; Cocos Islands, Indian Ocean; p. 538, Pl. 32, figs. 5–8: *Floresca parthenia* n.sp.; New Caledonia, tropical Pacific; p. 539: as *Floresca palladia*; New Guinea; p. 643: as *Floscula pandora* n.sp.; tropical Pacific. MAYER 1910, p. 605, text-figs. 385, 386: *Floresca parthenia*.

Genus *Parumbrosa* Kishinouye 1910

Ulmarinae with eight rhopalia, 24 tentacles, 64 lappets; the eight perradial and interradial canals branched, the eight adradial canals simple.

Type-species: *P. polylobata* Kishinouye.

Kishinouye 1910, p. 19: *Parumbrosa* n.g. Mayer 1910, p. 728.

Parumbrosa polylobata Kishinouye 1910

Up to 160 mm wide, flat, disk-shaped, gelatinous substance very delicate; exumbrella uniformly granulated; oral arms lanceolate, finely frilled, about as long as radius of disk; gonads long, narrow, transversely folded bands; tentacles fairly long; colourless.

Kishinouye 1910, p. 19, Pl. 4, figs. 20–3: *Parumbrosa polylobata* n.g., n.sp.; Japan. Mayer 1910, p. 728, text-fig. 428. Bigelow 1913, p. 94: southern Japan. Ranson 1945*b*, p. 317: Indochina. Uchida 1954, pp. 209–19: Japan.

Genus *Ulmaris* Haeckel 1880

Ulmarinae with eight rhopalia, eight adradial tentacles, and 16 marginal lappets; the eight adradial, tentacular canals simple, the eight rhopalar canals each with a pair of lateral branches; with or without anastomoses near ring canal; no canals in lappets.

Type-species: *U. prototypus* Haeckel.

Haeckel 1880, p. 545: *Ulmaris* n.g. Mayer 1910, p. 606: synonym of *Discomedusa*.

Ulmaris prototypus Haeckel 1880

30 mm wide; marginal lappets pointed, as long as broad; mouth-arms broad, egg-shaped; canals without anastomoses.

Haeckel 1880, p. 545, Pl. 33, figs. 1–4: *Ulmaris prototypus* n.g., n.sp.; St Helena, Atlantic. Mayer 1910, p. 607, text-fig. 387: as *Discomedusa lobata* in part. Stiasny 1935, p. 20: re-erects the genus and species.

Ulmaris snelliusi Stiasny 1935

18–25 mm wide, exumbrella with lines of nematocysts; marginal lappets rectangular, broad, with concave edge; mouth-arms narrow, pointed; canals with anastomoses.

Stiasny 1935, p. 20, Pl. 1, figs. 6, 7, text-figs. 1, 2: *Ulmaris snelliusi* n.sp.; Malay Archipelago. Stiasny 1937*b*, p. 206.

Genus **Undosa** Haeckel 1880

Ulmarinae with eight rhopalia, 40 tentacles, 48 lappets; eight branched perradial and interradial and eight simple adradial canals and a ring canal.

Type-species: *U. undulata* Haeckel.

Haeckel 1880, p. 546: *Undosa* n.g. Mayer 1910, p. 608.

Undosa undulata Haeckel 1880

120 mm wide, 40 mm high; a brown, 16-rayed star-like figure on exumbrella.

Haeckel 1880, p. 546, Pl. 33, figs. 5, 6: *Undosa undulata* n.g., n.sp.; coast of Guinea, W. Africa. Mayer 1910, p. 609, text-fig. 389. Kramp 1955*a*, p. 307: reference to Haeckel.

Subfamily STYGIOMEDUSINAE

Ulmaridae with branched radial canal system and a ring canal; with no marginal tentacles.

Genus **Stygiomedusa** Russell 1959

Stygiomedusinae with four long mouth arms; with alternating branched rhopalar and unbranched inter-rhopalar radial canals all anastomosing towards periphery.

Type-species: *S. fabulosa* Russell.

Russell 1959*b*, p. 1527: *Stygiomedusa* n.g.

Stygiomedusa fabulosa Russell 1959*

About 500 mm wide, disk-shaped; stomach large; 40 radial canals leaving stomach; 20 rhopalia; with asexual reproduction in specialized brood chambers; typical deep brown-red deep-sea coloration.

Russell 1959*b*, pp. 1527–29, figs. 1–2: *Stygiomedusa fabulosa* n.g., n.sp.; Bay of Biscay.

* See Addenda, p. 445.

Order RHIZOSTOMEAE

Scyphomedusae with umbrella margin cleft into lappets; without marginal tentacles; without a central mouth opening, but with numerous mouths upon eight adradial, fleshy, branched, arm-like appendages arising from the centre of the subumbrella; with rhopalia between marginal clefts.

(The treatment of the Rhizostomeae is mainly based on the more or less scattered remarks and descriptions in STIASNY'S numerous papers and does not claim to be a complete revision, though the bibliography may be rather complete.)

Suborder ***KOLPOPHORAE***

Mouth-arms dichotomous and triangular or three-winged. A network of anastomosing canals communicate with the central gastral cavity in several places between the radial canals. Rhopalar pits smooth, without radial folds. Subgenital ostia without papillae.

Kampylomyariae

Kolpophorae with subumbrellar muscles in feather-like arcs. Radial canals usually about twice as many as rhopalia (more or less than 32). Without or with faintly indicated ring canal. With four completely separated subgenital cavities. Subgenital ostia small, round. Stomach circular. Arm disk octagonal, with four primary canals. One family.

Family *CASSIOPEIDAE*

Genus ***Cassiopea*** Péron & Lesueur 1809

Cassiopeidae with eight pinnately or irregularly branched mouth-arms with ventral mouth-openings only and large or small vesicles; ring canal absent or faintly indicated; usually with 16 rhopalar and about 16 (or more) interrhopalar canals.

Type-species: *C. andromeda* (Forskål).

PÉRON & LESUEUR 1809, p. 356: *Cassiopea* n.g. HAECKEL 1880, pp. 567–8: as *Cassiopea* and *Polyclonia*. MAYER 1910, p. 636: *Cassiopea*. HUMMELINCK 1933, pp. 453–502: revision of the genus.

Cassiopea andromeda (Forskål 1775)

100–120 mm wide, 20–30 mm high, flat, disk-shaped; variable number of short, blunt, marginal lappets; mouth-arms wide, flat; 4–6 flat, short side branches arise from each arm in a tree-like manner; numerous small and five or more large, club-shaped vesicles on each arm between the mouths.

Forskål 1775, p. 107, Pl. 31, three figs.: as *Medusa andromeda* n.sp. Péron & Lesueur 1809, p. 356: as *Cassiopea* n.g. *forskalea.* Eschscholtz 1829, p. 43: *Cassiopea andromeda.* Mayer 1910, p. 637: *C. andromeda*; (east coast of Africa; Red Sea; Indian Ocean east to the Malayan Archipelago); p. 639: as *C. andromeda* var. *zanzibarica* Chun 1896; (Zanzibar coast, E. Africa); as *C. andromeda* var. *malayensis* Maas 1903; (Malayan Archipelago); as *C. andromeda* var. *maldivensis* Browne 1905*a*; (Maldive Islands, Indian Ocean); p. 640: as *C. andromeda* var. *acyclobalia* Schultze 1898; (Amboina, Malayan Archipelago); as *C. polypoides* Keller 1883; (Red Sea). Vanhöffen 1911*b*, p. 322, fig. 1*b*: *C. andromeda*; p. 327, text-figs. 4*a*, 5*a*, 5*b*: as *C. cyclobalia.* Light 1914*b*, p. 201, fig. 1: as *C. polypoides* var. *culionensis* nov. var.; Philippines; p. 203: as ?*C. polypoides.* Mayer 1915*a*, p. 183, fig. 3: as *C. andromeda* var. *baduensis* nov. var.; between Australia and New Guinea. Browne 1916*a*, p. 206: as *C. andromeda* var. *maldivensis*; Seychelles, Indian Ocean. Browne 1916*b*, p. 154: as *C. andromeda* var. *maldivensis*; west coast of India. Mayer 1917*a*, p. 207, fig. 12: as *C. andromeda* var. *baduensis*; N. Australia. Stiasny 1920, p. 222: *Cassiopeia andromeda*; Red Sea. Stiasny 1921*b*, p. 67: *C. cyclobalia – andromeda*; p. 70, Pl. 1, fig. 1, text-fig. 1: as *C. andromeda* var. *maldivensis*; Pl. 3, fig. 17, text-fig. 2: *C. andromeda*; Red Sea. Stiasny 1922*b*, p. 44: as *C. andromeda* var. *zanzibarica*; Zanzibar, E. Africa. Stiasny 1922*c*, p. 62: *Cassiopeja acyclobalia* a geographical variety of *C. andromeda.* Stiasny 1922*e*, p. 526: Johore Strait and Point Tello, India. Stiasny 1922*f*, p. 90, figs. 5, 6: as *C. andromeda* var. *malayensis*; anomalies. Stiasny 1924*a*, p. 488: *Cassiopeia andromeda*; Malayan Archipelago. Browne 1926, p. 112: *C. andromeda*; Suez Canal; p. 113: as *C. polypoides.* Stiasny 1926*a*, p. 245: as *C. polypoides* var. *culionensis*; Philippines. Stiasny 1929*c*, p. 198: *Cassiopeia andromeda*; Malayan Archipelago. Stiasny 1930*a*, p. 23: *Cassiopeia andromeda*; Fiji Islands. Rao 1931*a*, p. 40: as *C. andromeda* var. *maldivensis*; Indian Ocean. Stiasny 1931*a*, p. 140: *C. andromeda*; Australia; Solomon Islands; Mozambique, E. Africa; Suez Canal; Red Sea; N. of Madagascar; p. 141: as *C. andromeda* var. *maldivensis*; Maldive Islands, Indian Ocean; p. 142: as *C. polypoides* var. *culionensis*; Puerto Galera, Philippines. Hummelinck 1933, p. 482, fig. 35: as *C. andromeda* var. *malayensis* Maas; the original specimens examined; p. 484: *C. cyclobalia* (*acyclobalia* is a misprint) = *andromeda*; p. 485: *C. polypoides* var. *culionensis* = *andromeda.* Stiasny 1935, p. 34: Malayan Archipelago. Menon 1936, p. 3: Krusadai Island, India. Stiasny 1937*b*, p. 207: Malayan Archipelago. Stiasny 1938, p. 16, Pl. 1, fig. 4: Red Sea. Ranson 1945*b*, p. 318: Suez Canal; Red Sea; Indochina; Zanzibar; Poulo Condore, off Thailand; Mascate. Schäfer 1955, pp. 241–5, figs. 2–5: Aegean Sea, migrated from the Indian Ocean through the Suez Canal. Horridge 1956*b*, pp. 375–6, fig. 9: innervation; Red Sea. Searle 1957, p. 76: as *Cassiopeia* sp.; Singapore. Horridge 1959, pp. 78, 80, 84, 89, fig. 4 (diagram). Maaden 1959, p. 8: Gulf of Aqaba, Red Sea; p. 7: *C. polypoides* a valid species.

Cassiopea depressa Haeckel 1880

100–120 mm wide, 15–20 mm high; exumbrella flat, without aboral concavity or dome; 144 wide, pointed, not prominent lappets; mouth-arms very wide, flat, with 6–8 short, wide-spreading main branches; numerous very small club-shaped vesicles between the mouths.

Haeckel 1880, p. 572: *Cassiopea depressa* n.sp.; Madagascar and off coast of Mozambique, E. Africa. Mayer 1910, p. 649. Stiasny 1921*b*, p. 68.

Cassiopea frondosa (Pallas 1774)

120–260 mm wide; no concavity at centre of exumbrella; always 12 rhopalia; 60 short, nearly straight-edged marginal lappets; mouth-arms 3/4 the length of bell radius; scattered uniformly between the mouths are 30–40 small, leaf-shaped vesicles.

Pallas 1774, pp. 29, 30, Pl. 2, figs. 1–3: as *Medusa frondosa* n.sp. Péron & Lesueur 1809, p. 357: as *Cassiopea pallasii.* Lamarck 1816, p. 512: *Cassiopea frondosa.* L. Agassiz 1860, Pls. 13, 13*a*: as *Polyclonia* n.g. *frondosa.* Haeckel 1880, p. 568: *P. frondosa.* Mayer 1910, p. 647, Pl. 69, figs. 1–3, Pl. 72: *C. frondosa*; West Indies; Florida. Vanhöffen 1911*b*, p. 321: as *P. frondosa.* Vanhöffen 1913*a*, p. 430: as *P. frondosa*; West Indies. Mayer 1914*a*, pp. 16, 18, 22: Tortugas, Florida. Stiasny 1921*b*, p. 69. Stiasny 1922*f*, p. 85: as *Cassiopeia frondosa*; Curaçao. ?Rao 1931*a*, p. 40: ?*C. frondosa*; Arabia. Boone 1933, p. 45, Pl. 8: Cuba. Hummelinck 1933, pp. 454–67: discussion and description; pp. 480 ff.: revision of Stiasny's material; pp. 487–93, figs. 1–13, 37, 39, 40: comparison between *C. frondosa* and *xamachana*; Bonaire, West Indies. Smith 1937, pp. 17–52, one Pl., 20 text-figs., tab. 1–4: Tortugas, Florida. Hedgpeth 1954, p. 278: Gulf of Mexico. Kramp 1955*b*, p. 165: =*P. frondosa* Haeckel 1880.

Cassiopea medusa Light 1914

260 mm wide, flat with a thickened central disk; 17 rhopalia, seven irregular and indistinct velar lappets between successive rhopalia; mouth-arms 170 mm in length, with numerous small lateral branches in their proximal portion, distally with three main branches which are again subdivided; numerous appendages from small, inconspicuous to very large, cylindrical up to 110 mm long.

Light 1914*b*, p. 204, figs. 2, 3: *Cassiopea medusa* n.sp.; Philippines. Stiasny 1921*b*, p. 69: doubtful species. Stiasny 1926*a*, p. 244: new material; the species is retained; Philippines. Hummelinck 1933, p. 484: revision of the original material; the species retained. Chu & Cutress 1954, p. 9: cause of dermatitis; Hawaii.

Cassiopea mertensi Brandt 1838

100–120 mm wide, 30–40 mm high; bell evenly rounded without an aboral concavity; 128 small, tongue-shaped, prominently projecting lappets; mouth-arms cylindrical, 1½ times as long as bell radius, branched tree-like; numerous large club-shaped vesicles.

Brandt 1838*a*, p. 396, Pls. 20–3: *Cassiopea mertensii* n.sp.; Caroline Islands, tropical Pacific. Mayer 1910, p. 649. Vanhöffen 1911*b*, p. 323, figs. 1*c*, 2, 3, 4*b*. Stiasny 1921*b*, p. 68

Cassiopea ndrosia Agassiz & Mayer 1899

50 mm wide, with shallow concavity at centre of exumbrella; 18–22 rhopalia; lappets very indistinct, four in each octant; mouth-arms cylindrical,

1½ times as long as bell radius, branched tree-like; numerous small, flattened, expanded, leaf-shaped vesicles between mouths; no ribbon-like filaments.

AGASSIZ & MAYER 1899, p. 175, Pl. 14, text-figs. 45, 46: *Cassiopea ndrosia* n.sp.; Fiji Islands, South Pacific. MAYER 1910, p. 650. STIASNY 1921*b*, p. 68. STIASNY 1933*a*, pp. 913–22, fig. 1: Australia. RANSON 1945*b*, p. 318: New Caledonia, Pacific.

Cassiopea ornata Haeckel 1880

100–120 mm wide, flat; five lappets in each octant, blunt, indistinctly separated; mouth-arms cylindrical, slender, somewhat longer than bell radius, not broad and flat as in *C. andromeda*; only small, club-shaped vesicles between the mouths.

HAECKEL 1880, p. 570, Pl. 37, figs. 1–8: *Cassiopea ornata* n.sp.; Palao Islands, Pacific; New Guinea; Australia. MAYER 1910, p. 648: *C. ornata*; p. 648: as *C. ornata* var. *digitata* Maas; (Malayan Archipelago). STIASNY 1922*b*, p. 42: *Cassiopeia ornata*; Palao Islands. STIASNY 1923*b*, p. 226: *C. ornata* Stiasny 1922 ? = *C. picta*. HUMMELINCK 1933, p. 483, fig. 36: examination of the original specimen of *C. ornata* var. *digitata*. UCHIDA 1947*a*, p. 317: Palao Islands; Saipan Island, Central Pacific. UCHIDA 1954, pp. 209–19: Japan.

Cassiopea picta Vanhöffen 1888

Doubtful species.

VANHÖFFEN 1888, p. 26, Pl. 2, figs. 1, 2: *Cassiopeia picta* n.sp.; Red Sea. MAYER 1910, p. 649: as *Cassiopea depressa* var. *picta*. STIASNY 1921*b*, p. 68: ? = *C. ornata*. STIASNY 1923*b*, p. 226: as *Cassiopeia picta*; original specimens examined and found to be unrecognizable. BROWNE 1926, p. 113. MAADEN 1959, p. 7: *C. picta*, a valid species.

Cassiopea vanderhorsti Stiasny 1922

Up to 170 mm wide; flatly rounded, with a low central dome; 14 to 18 (usually 16) rhopalia; three to five (usually three) velar lappets in each octant; (it is very difficult to determine the number of velar lappets, as they are very short and have nearly coalesced with each other; the incisions on the margin are often faintly developed, occasionally lacking in some areas of the margin); mouth-arms pinnately dichotomous, about 3/4 of the length of diameter, with numerous small and a few large vesicles; a sinuous swelling on the distal third of the rhopalar canals.

STIASNY 1922*f*, p. 85, figs. 2–4, 7: *Cassiopea vanderhorsti* n.sp.; Curaçao, West Indies. HUMMELINCK 1933, p. 480, fig. 48: examination of the original specimens; as *C. xamachana* var. *vanderhorsti*.

Cassiopea xamachana R. P. Bigelow 1892

Usually 150 mm wide, flat and with rounded edges, well-marked central concavity; five lappets in each octant, short and blunt; mouth-arms, about 1¼ times the length of bell radius, triangular in cross-section, aboral surface broad and flat, with 10–15 alternate primary branches, with numerous large, ribbon-shaped filaments.

R. P. BIGELOW 1892, p. 212: *Cassiopea xamachana* n.sp.; Jamaica, West Indies. MAYER 1910, p. 641, Pl. 69, figs. 4–8, Pls. 70–2, text-figs. 402–3: development; West Indies and Florida. VANHÖFFEN 1911*b*, p. 321, fig. 1*a*: as *Polyclonia xamachana.* VANHÖFFEN 1913*a*, p. 430: as *P. xamachana*; West Indies. GOLDFARB 1914, pp. 83–94, figs. 1–4, tab. 1–6: Tortugas, Florida. MAYER 1914*a*, pp. 5–8, 13, 18: physiology; Florida. MAYER 1914*b*, pp. 25–54, figs. 1–13, tab. 1–15: physiology; Florida. MAYER 1914*c*, pp. 55–82, one Pl., tab. 1–27: physiology; Florida. CARY 1915*a*, pp. 202–4: as *Cassiopea*; physiology of nervous system. CARY 1915*b*, pp. 611–16, figs. 1, 2: physiology. CARY 1916*a*, pp. 709–13: physiology. CARY 1916*b*, pp. 1–32, figs. 1–11, tab. 1–4: physiology; Florida. CARY 1916*c*, pp. 195–201, tab. 1–5: physiology. HATAI 1916, pp. 206, 207: physiology. MAYER 1916*a*, pp. 721–6, figs. 1, 2, tab. I, II: physiology. MAYER 1916*b*, pp. 212–14, tab. 7, 8: physiology of nervous system; Tortugas, Florida. HATAI 1917, p. 217: chemical composition. MAYER 1917*b*, pp. 1–20, figs. 1–15, tab. 1–8: physiology of nervous system; Florida. CARY 1921, pp. 121–70, figs. 1–18, tab. 1–11: physiology of nervous system; Florida. HATAI 1921, pp. 95–109, fig. 1, tab. 1–8: physiology. STIASNY 1922*f*, p. 85: as *Cassiopeia xamachana* and spp.; Curaçao, West Indies. BOONE 1933, p. 42, Pl. 7: Florida. HUMMELINCK 1933, pp. 467 ff.: new descriptions; as *C. xamachana* var. *bonairensis* nov. var. (figs. 14–34, 38, 41, 42, 45–7); *C. xamachana* forma *typica*, *C. xamachana* var. *tortugensis* (figs. 43, 44); comparison between *C. xamachana* and *frondosa*. RANSON 1945*b*, p. 318: Haïti. BERRILL 1949*b*, pp. 401–8: development. HEDGPETH 1954, p. 278: Gulf of Mexico. CARTHY 1958, p. 197: as *Cassiopea*; responses to stimuli. SOUTHCOTT 1959, p. 577, fig. 6.

Actinomyariae

Kolpophorae with radial subumbrellar muscles. With eight rhopalar radial canals. Without a ring canal. With four more or less separated subgenital cavities. Subgenital ostia small, round. Stomach octagonal, with eight primary canals. One family.

Family *CEPHEIDAE*

Genus ***Cephea*** Péron & Lesueur 1809

With numerous (more than three) inter-rhopalar radial canals in each octant; central portion of exumbrella with warts; with long, pointed filaments on the mouth-arms.

Type-species: *C. octostyla* (Forskål).

PÉRON & LESUEUR 1809, p. 360: *Cephea* n.g. HAECKEL 1880, pp. 573, 612: *Cephea* and *Stylorhiza* n.g. MAYER 1910, p. 651: synonyms; *C. octostyla* the type species.

Cephea cephea (Forskål 1775)

100–140 mm wide, a large dome at apex, the dome covered completely with about 30 large, conical, pointed warts; 80–90 marginal lappets, in each octant 8–9 large oval velar lappets between two very small, pointed ocular lappets; upper halves of the eight, stout mouth-arms nearly coalesced at base, lower halves forked and profusely branched; more than 100 long, tapering, pointed filaments; 5–6 inter-rhopalar canals in each octant; distinguished by the very deep rhopalar clefts, the long tapering mouth-arm filaments and the brown colour.

FORSKÅL 1775, p. 108, Pl. 30: as *Medusa cephea* n.sp.; Red Sea. PÉRON & LESUEUR 1809, p. 361: as *Cephea rhizostomoidea*. HAECKEL 1880, pp. 574, 576, Pl. 36, figs. 3–6: as *C. forskalea* and *conifera*. MAYER 1910, p. 654, text-fig. 406: *Cephea cephea*; (Japan; Indian and Pacific oceans). LIGHT 1914*b*, p. 206: Philippines. LIGHT 1921, p. 32: Philippines. STIASNY 1921*b*, p. 75. STIASNY 1926*b*, p. 251: Australia. STIASNY 1929*c*, p. 200, fig. 1: Malay Archipelago. BOONE 1938, p. 48: Marquesas Islands, Pacific. STIASNY 1938, p. 18, Pl. 2, figs. 5, 6, text-figs. A, B: Red Sea. RANSON 1945*b*, p. 318: Gambier and Touamotou, Pacific. UCHIDA 1947*a*, p. 342: Japan. UCHIDA 1954, pp. 209–19: Japan. YAMAZI 1958, p. 139: Tanabe Bay, Japan.

Cephea coerulea Vanhöffen 1902

57 mm wide; the dome-like apex with 6–8 large and about 30 small, round protuberances, surrounded by a wide annular furrow; no marginal lappets; mouth-arms dichotomous, each with four long filaments; numerous very small filaments among the mouths; seven inter-rhopalar canals in each octant.

VANHÖFFEN 1902, p. 45, Pl. 4, figs. 13, 14: *Cephea coerulea* n.sp.; east coast of Africa. MAYER 1910, p. 657, text-fig. 408: as *C. cephea* var. *coerulea*. STIASNY 1921*b*, p. 75: *C. coerulea*. STIASNY 1938, p. 23: *C. coerulea* a valid species. KRAMP 1955*a*, p. 302: off Sierra Leone and Nigeria, W. Africa.

Cephea conifera Haeckel 1880

100–120 mm wide, 30–40 mm high; a thick-walled, flatly rounded, central dome bears 20–30 large and numerous small protuberances, surrounded by deep annular furrow; eight rhopalia in deep niches; 80 indistinct lappets; mouth-arms bifurcated near outer end, with numerous short branches; only one long, stout filament from each of the four perradial corners of the ventral side of the arm-disk; also more than 100 long, slender filaments between the mouths; numerous inter-rhopalar canals in each octant.

HAECKEL 1880, p. 576, Pl. 36, figs. 3–6: *Cephea conifera* n.sp.; Caroline and Samoa Islands, tropical Pacific. MAYER 1910, p. 655, text-fig. 407: as *C. cephea* var. *conifera*. STIASNY 1921*b*, p. 75: *C. conifera*. STIASNY 1922*c*, p. 63, fig. 1. STIASNY 1938, p. 23: *C. conifera* = *cephea*.

Cephea octostyla (Forskål 1775)

90 mm wide, 20 mm high, exumbrella flat, rim vertical; exumbrella with a zone of numerous low warts leaving central portion free; about 72 marginal lappets, seven velar and two ocular in each octant, rectangular, separated by

very slight indentations which are spanned by a web; eight bifurcated mouth-arms with numerous short filaments, and in middle region 4–12 long, tapering, wart-covered filaments.

Forskål 1775, p. 106, Pl. 29: as *Medusa octostyla* n.sp.; Red Sea. L. Agassiz 1862, p. 156: *Cephea octostyla*. Haeckel 1880, p. 613: as *Stylorhiza octostyla* n.g.; Singapore. Mayer 1910, p. 652, text-fig. 405: *C. octostyla*; Philippines. Mayer 1915*a*, p. 184: Philippines. Mayer 1917*a*, p. 209, fig. 13: Philippines. Stiasny 1921*b*, p. 73: Forskål's *Medusa octostyla* is doubtful, and not = *C. octostyla* L. Agassiz. Stiasny 1926*b*, p. 251, fig. 2: as *C. octostyla* juv.? Australia.

Cephea sp. Mayer 1915

Mayer 1915*a*, p. 185: *Cephea* sp.; Philippines. Mayer 1917*a*, p. 210: *Cephea* sp.; Philippines.

Cephea sp. Stiasny 1937

Stiasny 1937*a*, p. 229, text-fig. 11: *Cephea* sp.; Arabian Sea.

Cephea sp. Kramp 1958

Kramp 1958*b*, p. 372: *Cephea* juv.; the Nicobars, Indian Ocean.

Genus ***Cotylorhiza*** L. Agassiz 1862

Cepheidae with numerous (up to 13) short radial canals in each octant; exumbrella with a smooth central dome without warts; mouth-arms with stalked suckers.

Type-species: *C. tuberculata* (Macri).

L. Agassiz 1862, p. 158: *Cotylorhiza* n.g. Mayer 1910, p. 658. Thiel 1958*b*, p. 48: discussion on alternation of generations.

Cotylorhiza ambulacrata Haeckel 1880

90 mm wide; with 11–13 radial canals in each octant; ? = *C. tuberculata*.

Haeckel 1880, p. 611: *Cotylorhiza ambulacrata* n.sp.; Canary Islands. Mayer 1910, p. 659: probably synonym of *C. tuberculata*. Stiasny 1921*b*, p. 82: the species is retained. Stiasny 1922*c*, p. 65: by a mistake *Stomaster palmatus* Haeckel from the Atlantic has been the type specimen of *C. ambulacrata*.

Cotylorhiza erythraea Stiasny 1920

Up to 90 mm wide; 4–6 radial canals in each octant.

Stiasny 1920, p. 223: *Cotylorhiza erythraea* n.sp.; Suez Canal. Stiasny 1921*b*, p. 84, Pl. 1, fig. 3, Pl. 3, fig. 23, Pl. 5, fig. 38: Suez Canal.

'*Cotylorhiza*' *pacifica* Mayer 1915

Probably about 200 mm in diameter; about eight irregularly spaced, bluntly pointed velar lappets in each octant, with deep furrows between them; the eight mouth-arms with window-like openings in the lateral membranes; proximal portion of arms 1/4 of the length of distal portion; centre of arm-disk with numerous slender filaments; appendages on outer parts of arms not very numerous; the eight rhopalar canals twice as wide as the inter-rhopalar canals, of which there are 16–17 in each octant. Doubtful species.

MAYER 1915*a*, p. 185, fig. 4: *Cotylorhiza pacifica* n.sp.; Philippines. MAYER 1917*a*, p. 211, fig. 14: Philippines. LIGHT 1921, p. 37: as *Cotylorhizoides pacifica* n.g.; examination of type-specimen. STIASNY 1921*b*, p. 81: discussion; the species cannot be retained. STIASNY 1924*b*, p. 50: *Cotylorhizoides pacificus* Light 1921, p. 39 non =*C. pacifica* Mayer. STIASNY 1924*c*, p. 65: possibly to *Phyllorhiza.*

Cotylorhiza tuberculata (Macri 1778)

Usually less than 170 mm wide; with smooth, elevated dome surrounded by a gutter-like ring; marginal lappets elongated, subrectangular; each mouth-arm bifurcates near its base, branching several times; numerous short, club-shaped appendages with expanded, disk-like ends, and some less numerous somewhat larger ones; in addition numerous longer filaments with expanded ends; 7–9 radial canals in each octant.

MACRI 1778*a*, p. 20: as *Medusa tuberculata* n.sp. DELLE CHIAJE 1822, p. 75, Pls. 3, 4, figs. 1–6, Pls. 140, 141: as *Cassiopea borbonica* n.sp. ESCHSCHOLTZ 1829, p. 56: as *Cephea tuberculata.* L. AGASSIZ 1862, p. 158: *Cotylorhiza tuberculata* n.g. MAYER 1910, p. 659, Pl. 73, fig. 2, text-fig. 410: synonyms; (Mediterranean) Naples, Italy (new record); (Red Sea; ? Canary Islands). STIASNY 1920, p. 223: Mediterranean. STIASNY 1921*b*, p. 82: *Cassiopea borbonica* =*C. tuberculata*; Trieste. STIASNY 1922*c*, p. 66: Mediterranean. ANSELMI 1923, p. 73: as *Cothyloriza microtuberculata*; Mediterranean. FREINKEL 1925, pp. 658–90: experiments on orientation. KRAMP 1925, p. 53, fig. 39: Mediterranean. STIASNY 1930*a*, p. 23: Naples. STIASNY 1931*a*, p. 143: Naples. BENAZZI 1933, pp. 212, 216. BOONE 1933, p. 47, Pl. 9: Monaco. WEILL 1934*b*, p. 547, figs.: nematocysts. BRUNELLI 1941, p. 55: Venice, Italy. FOX & PANTIN 1944, p. 121: as *Cassiopeia borbonica*; pigmentation. RANSON 1945*b*, p. 318: Mediterranean. RANSON 1945*c*, p. 67, Pl. 1, figs. 5, 6: S.W. of Balearics, Mediterranean. SKRAMLIK 1945, pp. 296–336: experiments; Naples. BERRILL 1949*b*, pp. 399–407: development. ROSSI 1950, p. 29: Golfo di Rapallo, Italy. KRAMP 1955*b*, p. 166. CARTHY 1958, p. 197: responses to stimuli. HOENIGMAN 1958, pp. 261–2: Adriatic Sea.

Genus ***Netrostoma*** L. S. Schultze 1898

Cepheidae with three inter-rhopalar canals in each octant; exumbrella with large warts on central dome; stiff appendages on mouth-arms and arm-disk.

Type-species: *N. typhlodendrium* Schultze.

L. S. SCHULTZE 1898, p. 457: *Netrostoma* n.g. MAYER 1910, p. 651: synonym of *Cephea.*

Netrostoma coerulescens Maas 1903

200 mm wide or more; with a central dome with about 10 wart-like projections; 6–8 round-edged lappets in each octant; the eight mouth-arms short, massive, laterally compressed, curved outwards, bifurcated at outer ends and with numerous short lateral branches, with two kinds of appendages between the mouths: the one small, thin, tubular with prominent nematocyst warts, and the other somewhat larger, spindle-shaped.

MAAS 1903, p. 35, Pl. 5, figs. 37, 46, Pl. 11, figs. 97, 103, Pl. 12, fig. 109: *Netrostoma coerulescens* n.sp.; Malay Archipelago. MAYER 1910, p. 653: as *Cephea octostyla* var. *coerulescens*; (Maldive Islands). STIASNY 1920, p. 223: *N. coerulescens*; Panaroekan, Malayan Archipelago. STIASNY 1921*b*, p. 77, Pl. 1, fig, 2, Pl. 3, figs. 19, 20, text-figs. 3, 4. STIASNY 1922*e*, p. 526: Jolo, Philippines; p. 527: '*Polyrhiza vesiculosa*' from Suez probably = *N. coerulescens*. STIASNY 1926*a*, p. 246: Philippines. STIASNY 1926*b*, p. 251: Australia. STIASNY 1929*c*, p. 199: Malay Archipelago. STIASNY 1931*a*, p. 142: Maldive Islands, Indian Ocean. STIASNY 1931*b*, p. 36: Australia. MENON 1936, p. 4: Krusadai Islands, India. STIASNY 1937*a*, p. 229: Arabian Sea. RANSON 1945*b*, p. 318: Indochina; coast of Malabar. NAIR 1951, p. 74: Trivandrum coast, India. ?GEORGE 1953, p. 82: *Netrostoma* sp.; Calicut, southern India. UCHIDA 1954, pp. 209–19: Japan. KRAMP 1955*b*, p. 165: by Haeckel 1880 determined as *Polyrhiza vesiculosa.*

Netrostoma dumokuroa (Agassiz & Mayer 1899)

300 mm wide, flat, disk-shaped, with vertical sides near margin; with a large, prominent dome, smooth, surrounded by two verticils of solid projections and a wide, shallow furrow; marginal lappets scarcely perceptible; eight short bifurcated mouth-arms; no filaments and no club-shaped appendages; colour blue.

AGASSIZ & MAYER 1899, p. 172, Pls. 11, 12, figs. 36–9: as *Cephea dumokuroa* n.sp.; Fiji Islands, Pacific. MAAS 1903, p. 38: *Netrostroma dumokuroa.* MAYER 1910, p. 656: as *C. cephea* var. *dumokuroa.* STIASNY 1921*b*, p. 75.

Netrostoma setouchianum (Kishinouye 1902)

100–200 mm wide, with a prominent central dome covered completely by 50 or more solid, pointed projections, and surrounded by a wide annular furrow; 6–8 flatly rounded velar lappets in each octant; mouth-arms with numerous small, short appendages among the frilled mouths.

KISHINOUYE 1902, p. 11, Pls. 1, 2, figs. 8–10: as *Microstylus setouchianus* n.g., n.sp.; Japan. BROWNE 1905*a*, p. 967: *Netrostoma setouchianus.* MAYER 1910, p. 657, text-fig. 409: as *Cephea cephea* var. *setouchiana.* BIGELOW 1913, p. 101: as *C. cephea* var. *setouchiana*; Japan. STIASNY 1937*d*, pp. 110-15, figs. 1, 2: *N. setouchianum*; Fiji Islands, Pacific. UCHIDA 1938*a*, p. 149: *N. setouchiana*; Japan. UCHIDA 1954, pp. 209–19: *N. setouchiana.* YAMAZI 1958, p. 139: Tanabe Bay, Japan.

Netrostoma typhlodendrium Schultze 1898

110 mm wide, flatly rounded; with low central dome completely covered

by about 80 rounded warts; about eight rounded or cleft velar lappets in each octant; ocular lappets sharp-pointed; small, spindle-shaped, sharp-pointed filaments only on the arm-disk.

SCHULTZE 1898. p. 457, Pl. 34, figs. 10–12*a*: *Netrostoma typhlodendrium* n.g., n.sp.; Amboina, Malayan Archipelago. MAYER 1910, p. 658: as *Cephea typhlodendrium*. STIASNY 1922*c*, p. 66, fig. 2. STIASNY 1929*c*, p. 199: Malayan Archipelago. RAO 1931*a*, p. 41: Indian Ocean. STIASNY 1937*d*, p. 114: *N. typhlodendrium* is considered identical with *N. coerulescens*.

Genus ***Polyrhiza*** L. Agassiz 1862

Doubtful genus.

L. AGASSIZ 1862, p. 156: *Polyrhiza* n.g. for *Cephea vesiculosa* Ehrenberg. MAYER 1910, p. 663. STIASNY 1921*b*, p. 73: discussion.

Polyrhiza vesiculosa (Ehrenberg 1835)

Doubtful species, insufficiently described by Ehrenberg.

EHRENBERG 1835, p. 260: as *Cephea vesiculosa* n.sp.; Red Sea. L. AGASSIZ 1862, p. 156: *Polyrhiza vesiculosa* n.g. MAYER 1910, p. 663: description from Haeckel. STIASNY 1921*b*, p. 73: doubtful species. STIASNY 1922*e*, p. 527: a specimen from Suez, determined by Haeckel, probably = *Netrostroma coerulescens*.

Krikomyariae

Kolpophorae with annular subumbrellar muscles. With eight rhopalar radial canals. With ring canal. With a continuous genital porticus. Subgenital ostia very broad. Arm-disk quadratic, with four primary canals.

Family *MASTIGIIDAE*

Krikomyariae with short, pyramidal, three-winged mouth-arms; with filaments on the arm-disk.

Genus ***Mastigias*** L. Agassiz 1862

Mouth-arms terminating in a naked, club-shaped extremity; mouths not only along the three edges of the mouth-arms, but also on their flat, expanded sides; numerous small clubs and filaments between the frilled mouths; intracircular mesh-work of canals with 6–20 canal-roots in each octant, usually communicating with the rhopalar canals.

Type-species: *M. papua* (Lesson).

L. AGASSIZ 1862, p. 152: *Mastigias* n.g. HAECKEL 1880, pp. 622, 624: as *Mastigias* and *Eucrambessa* n.g. VANHÖFFEN 1888, pp. 33, 35, 44, 45: as *Mastigias* and *Desmostoma*. MAYER 1910, p. 677.

Mastigias albipunctatus Stiasny 1920

Up to 145 mm wide, usually faintly vaulted, exumbrella with a network of nematocyst warts, with a whitish accumulation of nematocysts at apex; number of velar lappets variable, 6–14 in each octant; arm-disk with one very long central filament surrounded by several shorter; mouth-arms about as long as disk-radius, their terminal appendages variable in length and shape; 12–14 canal-roots in each octant; perradial rhopalar canals shorter and broader than the interradial, with few or no anastomoses.

Stiasny 1920, p. 224: *Mastigias albipunctata* n.sp.; Malayan Archipelago. Stiasny 1921*b*, p. 93, Pl. 1, fig. 5, Pl. 3, figs. 24–6, Pl. 5, fig. 46: Malayan Archipelago. Stiasny 1929*c*, p. 202: Malayan Archipelago. Rao 1931*a*. p. 44: Mergui Archipelago, Indian Ocean. Stiasny 1931*a*, p. 144: Malayan Archipelago; Australia. Stiasny 1935, p. 35: Malayan Archipelago. Stiasny 1937*b*, p. 207: Malayan Archipelago.

Mastigias andersoni Stiasny 1926

Up to 90 mm wide, vaulted, exumbrella with polygonal network of nematocyst warts; six broad velar lappets in each octant, the two median lappets usually split; arm-disk quadratic, with one central and four peripheral filaments; mouth-arms about as long as disk radius, without filaments, terminal appendages long, with a club-shaped swelling at the end of the long, thin pedicel; 12–15 (or 18) canal-roots in each octant; perradial rhopalar canals bottle-shaped, without anastomoses.

Stiasny 1926*b*, p. 252, fig. 3: *Mastigias andersoni* n.sp.; Australia.

Mastigias gracilis (Vanhöffen 1888)

35 mm wide, thin at margin but very thick at apex, exumbrella with irregularly placed clusters of small warts; margin irregularly lobed, with 5–10 lappets in each octant; arm-disk with particularly long filaments; mouth-arms hardly as long as disk radius, lower three-winged portion 3–4 times as long as upper portion; each arm with a short, rounded terminal knob, and with short, gelatinous knobs between the frilled mouths; 6–7 canal-roots in each octant.

Vanhöffen 1888, pp. 35, 45, Pl. 4, figs. 5–7: as *Desmostoma gracile* n.g., n.sp.; Assab, Red Sea. Mayer 1910, p. 681: *Mastigias gracile.* Stiasny 1921*b*, p. 89: a valid species. Stiasny 1923*b*, p. 227: examination of the original specimens.

Mastigias ocellatus (Modeer 1791)

About 100 (up to 190) mm wide, exumbrella with nematocyst warts in polygonal pattern, and with 'eye-spots', consisting of white circles with brown centre and brown rim; gelatinous substance firm; about 12 rounded velar lappets in each octant; arm-disk with few filaments; mouth-arms shorter than disk radius, broad, with large and firm lateral branches and with clubs and filaments, terminal appendage triangular in cross-section; 15–20 canal-roots in each octant; perradial rhopalar canals bottle-shaped, without anastomoses.

Modeer 1791, p. 27: as *Medusa ocellata* n.sp. Haeckel 1880, p. 606, Pl. 40, figs. 9-12: as *Versura palmata* n.g., n.sp.; Malayan Archipelago p. 623: *Mastigias ocellata*; near Cocos Islands, Indian Ocean; Straits of Sunda. Mayer 1910, p. 680: (China Sea; Hong Kong); Philippines; (eastern part of Indian Ocean); p. 685: as *Versura palmata* (Japan). Mayer 1915*a*, p. 194: Philippines. Mayer 1917*a*, p. 220: Philippines. Stiasny 1921*b*, p. 89: *M. ocellata*; p. 104: as *V. palmata*; imperfectly described; *V. palmata* Goette 1886 from Zanzibar and Japan to *Mastigias*. Stiasny 1922*e*, p. 530, figs. 4–6: Malayan Archipelago; p. 538: the type-specimen of '*V. palmata*' Haeckel = *M. ocellata*. Stiasny 1924*a*, p. 490, figs. 2, 3: Malayan Archipelago. Rao 1931*a*, p. 43: Indian Ocean. Ranson 1945*b*, p. 319: Straits of Sunda. Kramp 1955*b*, p. 166: by Haeckel 1880 determined as *Versura palmata* and *Cotylorhiza*?

Mastigias pantherinus Haeckel 1880

Size? exumbrella with 'eye spots' like *M. ocellatus*; 16 velar lappets in each octant; mouth-arms nearly as long as bell diameter, upper portion hardly half as long as the three-winged lower portion; terminal club very long, 2–3 times as long as bell diameter; more than 10 canal-roots in each octant.

Haeckel 1880, p. 624: *Mastigias pantherina* n.sp.; Samoa Islands, Pacific. Mayer 1910, p. 681. Stiasny 1921*b*, p. 89: the species only seen by Haeckel, but it seems well characterized.

Mastigias papua (Lesson 1830)

Up to 80 mm wide, usually hemispherical, exumbrella with very fine granulations; gelatinous substance firm; deep furrows between the eight velar lappets (in each octant); mouth-arms about half as long as bell diameter, the simple upper portion 1½ times as long as the three-winged lower portion; each arm usually, but not always, terminates in a club-like filament, triangular in cross-section; numerous small, club-shaped vesicles between mouths; less than 10 canal-roots in each octant; rhopalar canals slender, usually with anastomoses.

Lesson 1830, p. 122, Pl. 11, figs. 2, 3: as *Cephea papua* n.sp. L. Agassiz 1862, p. 152: *Mastigias papua* n.g. Kishinouye 1895, pp. 86–8, Pl. 13, figs. 1–13: as *M. physophora* n.sp.; Shima and Sagami, Japan. Maas 1903, p. 66, Pl. 6, figs. 54–7, Pl. 7, figs. 58, 59, 61, 64, Pl. 8, figs. 75–7, Pl. 9, figs. 84, 85, Pl. 12, fig. 110: as *M. papua* var. *sibogae* nov. var.; Malayan Archipelago. Mayer 1910, p. 678, text-fig. 415: = *M. physophora* Kishinouye; (Indian and Pacific oceans to Japan and Fiji Islands); p. 680: as *M. papua* var. *sibogae* Maas. Bigelow 1913, p. 100: Japan. Light 1914*b*, p. 209: Philippines. Mayer 1915*a*, pp. 160, 193: Torres Straits; Philippines. Mayer 1917*a*, p. 220: Philippines. Okada 1917, pp. 389–400: as *M. physophora*. Stiasny 1920, p. 223: Japan. Light 1921, p. 42: Philippines.

STIASNY 1921*b*, p. 92: Japan. STIASNY 1922*c*, p. 67: *M. physophora = papua.* STIASNY 1922*e*, p. 529, fig. 3: Siam; Philippines; East Asia; Sumatra. STIASNY 1924*a*, p. 489: Malayan Archipelago. STIASNY 1926*a*, p. 247: as *M. papua* var. *sibogae*; Philippines. UCHIDA 1926*a*, pp. 119–25. UCHIDA 1926*b*, pp. 45–95, Pl. 6, text-figs. 1–49: Japan. OKADA 1927*b*, p. 252, fig. 1. OKADA 1927*c*, p. 539, figs. 24–7. UCHIDA 1928*a*, p. 376: on the size. RAO 1931*a*, p. 45: as *M. papua* var. *sibogae*; Indian Ocean. STIASNY 1931*a*, p. 144: northern Australia. STIASNY 1935, p. 35: Malayan Archipelago. STIASNY 1937*b*, p. 207. BOONE 1938, p. 49, Pl. 7: Malayan Archipelago. UCHIDA 1938*a*, p. 149: Japan. STIASNY 1940*a*, p. 23, fig. C: New Caledonia; Gulf of Siam. KINOSHITA 1941, pp. 209–20: experiments; Japan. RANSON 1945*b*, p. 318: Indochina. UCHIDA 1947*a*, p. 318: Palao Islands and Saipan Islands, central Pacific. UCHIDA 1947*b*, p. 343: Japan. BERRILL 1949*b*, pp. 393–409, figs.: development. CHIU 1954*b*, p. 56. UCHIDA 1954, pp. 209–19: Japan. KRAMP 1955*b*, p. 167. UCHIDA 1955*a*, p. 15: Loochoo Islands, S. of Japan. SEARLE 1957, p. 76, fig. 4*b*: Singapore. YAMAZI 1958, p. 139: Tanabe Bay, Japan.

Mastigias roseus (Reynaud 1830)

Size? Disk flat and hat-shaped; deep radial furrows between the 7–8 velar lappets (in each octant); eight separate (!) mouth-arms, short, with numerous appendages, terminal appendage club-shaped. Doubtful species.

REYNAUD 1830, p. 97, Pl. 34: as *Rhizostoma rosea* n.sp.; tropical Atlantic. HAECKEL 1880, p. 586: as *Toxoclytus roseus* L. Agassiz. VANHÖFFEN 1888, p. 45: *Mastigias roseus.* MAYER 1910, p. 681: *M.*(?) *rosea.* STIASNY 1921*b*, pp. 89, 143: doubtful species, probably to *Mastigias*.

Mastigias sidereus Chun 1896

70 mm wide, flatly rounded; velar lappets semicircular, six in each octant, the two median lappets split; subumbrella and mouth-arms with white spots; mouth-arms twice as long as disk radius, the simple upper part somewhat longer than the lower three-winged part; terminal appendage long and club-shaped; intracircular mesh-work of canals with large, open meshes; about seven canal-roots in each octant, all rhopalar canals with anastomoses.

CHUN 1896, p. 13, Pl. 1, fig. 3: *Mastigias siderea* n.sp. MAYER 1910, p. 679: as *M. papua* var. *siderea*; synonym: ?*Eucrambessa mülleri* Haeckel from Madagascar; (Zanzibar, East Africa; western part of the Indian Ocean). STIASNY 1920, p. 224: Singapore; Sumatra. STIASNY 1921*b*, p. 92, Pl. 1, fig. 4: Singapore; Sumatra. STIASNY 1922*b*, p. 44: Zanzibar. RANSON 1945*b*, p. 319: Sunda Straits.

Mastigias sp. Rao 1931

RAO 1931*a*, p. 45: *Mastigias* sp.; Mergui Archipelago, Indian Ocean.

Genus ***Mastigietta*** Stiasny 1921

Mouth-arms without appendages, their upper, undivided portion much reduced, almost rudimentary, and only partly united by eight membranes.

Type-species: *M. palmipes* (Haeckel).

STIASNY 1921*b*, p. 100: *Mastigietta* n.g.

Mastigietta palmipes (Haeckel 1880)

Up to 70 mm wide; exumbrella with numerous warts of nematocysts, but lappet region smooth; 5–8 velar lappets in each octant; mouth-arms thick, shorter than disk radius, without appendages; arm-disk with filaments; 12–14 canal-roots in each octant; rhopalar canals with anastomoses throughout their length.

HAECKEL 1880, p. 620: as *Crambessa palmipes* n.sp.; northern Australia. SCHULTZE 1898, p. 453, Pl. 33, fig. 1, Pl. 34, fig. 11: as *Crambessa palmipes*. MAYER 1910, p. 667: as *Catostylus palmipes*; (from Malayan Archipelago to northern Australia). STIASNY 1921*b*, p. 100: *Mastigietta palmipes* n.g. STIASNY 1922*c*, p. 68: examination of Haeckel's original specimen, a young Leptobrachid; Schultze's specimen an abnormal *Thysanostoma* or *Himantostoma*. ?STIASNY 1931*a*, p. 147: as '?*Mastigietta palmipes*'; Mauritius; Indian Ocean. MENON 1936, p. 6, Pl. 1, fig. 2: Krusadai Islands, Indian Ocean.

Genus ***Phyllorhiza*** L. Agassiz 1862

Mouth-arms broad, leaf-shaped, with large window-like openings in the lateral membranes, lower parts of the mouth-arms with numerous filaments; intracircular mesh-work of canals never communicating with the perradial rhopalar canals.

Type-species: *P. punctata* von Lendenfeld.

L. AGASSIZ 1862, p. 158: *Phyllorhiza* n.g. HAECKEL 1880, p. 588. MAYER 1910, p. 684: *P. chinensis* L. Agassiz and *P. trifolium* Haeckel imperfectly described; *P. punctata* Lendenfeld is the type-species. STIASNY 1924*c*, p. 56: new diagnosis of the genus.

Phyllorhiza luzoni Mayer 1915

60 mm wide, flat, exumbrella finely granular; nine rounded velar lappets in each octant; mouth-arms slender, strongly compressed, naked upper part 13 mm, three-winged lower part 11 mm; appendages lost; in each octant 6–9 inter-rhopalar canals anastomosing with the eight rhopalar canals (!). Systematic position uncertain.

MAYER 1915*a*, p. 194, fig. 7: *Phyllorhiza luzoni* n.sp.; Philippines. MAYER 1917*a*, p. 221, fig. 20; Philippines. STIASNY 1921*b*, p. 101: doubtful species, ? = *Mastigias papua*. STIASNY 1924*c*, p. 65: possibly to *Phyllorhiza*.

Phyllorhiza pacifica (Light 1921)

20–30 mm wide; in each octant eight velar lappets, in the middle two double lappets, at each side of these two single lappets and one ocular pointed lappet; terminal appendages nearly as long as the mouth-arms, predominantly purple in colour.

LIGHT 1921, p. 37, fig. 4: as *Cotylorhizoides pacificus* (Mayer 1915) juv.; Manila Bay, Philippines. STIASNY 1924*b*, p. 50: *Phyllorhiza pacifica* (Light, non Mayer).

Phyllorhiza punctata von Lendenfeld 1884

Up to 500 mm wide, jelly very thick, exumbrella finely granular; velar lappets some broad and double, others simple, altogether up to 14 in each octant; arm-disk with numerous filaments; arms three-winged, with numerous tapering, bluntly ending filaments, up to 2/3 of the length of the arms; terminal appendages sometimes very long, with distal expansion; 10–12 canal-roots in each octant.

von Lendenfeld 1884*c*, pp. 296, 307, Pl. 4, fig. 1, Pl. 5, figs. 1–4: *Phyllorhiza punctata* n.sp.; Port Jackson, Australia. Mayer 1910, p. 684. Stiasny 1921*b*, pp. 101, 102: both genus and species are doubtful. Stiasny 1924*c*, p. 56, figs. 1–4: new diagnosis of the genus; Sydney, Australia. Stiasny 1926*b*, p. 255: Philippines. Stiasny 1931*a*, p. 144: Australia. Uchida 1954, pp. 209–19: as *P. trifolium* Haeckel; Japan.

Family *VERSURIGIDAE* nov. fam.

Krikomyariae with broad, leaf-shaped mouth-arms.

Genus ***Versuriga*** n.g.

Mouth-arms three-winged, broad, with secondary lappets and with clubs and filaments; without a terminal appendage; arm-disk with filaments.

Type-species: *V. anadyomene* (Maas).

Haeckel (1880) proposed the generic name *Versura* n.g., (p. 606) for three new species of Rhizostomae, *palmata* (p. 606), *pinnata* (p. 607) and *vesicata* (p. 645).

The genus was adopted by Mayer (1910 p. 685) with *V. palmata* as the type-species; he also described a new species, *V. maasi* (p. 687), and to the same genus he referred *Crossostoma anadyomene* Maas 1903. Haeckel's *V. pinnata* and *vesicata* were regarded as doubtful species. Mayer also stated that the generic name *Crossostoma* L. Agassiz 1862 p. 155 was preoccupied for a Mollusc.

Stiasny (1922*e* p. 538) examined Haeckel's type-specimen of *V. palmata* in the Zoological Museum of Copenhagen and found that it is a *Mastigias papua* (Lesson 1830). He, too, was of the opinion that *V. pinnata* and *vesicata* Haeckel are unidentifiable, and he stated that *V. maasi* Mayer 1910 is identical with *V. anadyomene* (Maas 1903) which accordingly is the only valid species of the genus.

Since the type has been identified with a species in another genus and since Haeckel's two other species are invalid, the generic name *Versura* must be rejected. It cannot be used for *Crossostoma anadyomene* Maas. Stiasny, however, retained the name *Versura* in a new sense with himself as author, which is not permissible. It is necessary to assign another generic name to *Crossostoma anadyomene*.

Since the older names *Stomaster* L. Agassiz 1862 (for *Cassiopea canariensis* and *C. frondosa* Tilesius 1829) and *Toxoclytus* L. Agassiz 1862 (for *Rhizostoma rosea* and *Cephea dubreuilii* Renaud 1830) cannot be used, it seems impossible to find an earlier generic name for *Crossostoma anadyomene* Maas. Hence a new generic name is necessary, and I propose

Versuriga n.g.

with *V. anadyomene* (Maas 1903) as the type-species by monotypy.

MAAS 1903, p. 56: as *Crossostoma*. MAYER 1910, p. 686: as *Versura*.

Versuriga anadyomene (Maas 1903)

Up to 600 mm wide, quite flat, exumbrella with network of anastomosing furrows; in each octant about eight large semicircular velar lappets alternating with small, narrow lappets; arm-disk with filaments; mouth-arms about as long as disk radius, strongly laterally compressed, with numerous flat, membraneous branches, with small club-shaped vesicles and on ventral side tapering filaments; perradial rhopalar canals broad, without anastomoses, the interradial narrow, with numerous anastomoses.

MAAS 1903, p. 56, Pl. 7, figs. 65–8: as *Crossostoma anadyomene* n.sp.; Malayan Archipelago. MAYER 1910, p. 686: as *Versura anadyomene*, *Crossostoma* being preoccupied; p. 687, text-fig. 416: as *Versura maasi* n.sp.; Philippines. MAYER 1915*a*, p. 195: as *Versura maasi*; Philippines. MAYER 1917*a*, p. 222, fig. 21: as *Versura maasi*; Philippines. STIASNY 1921*b*, p. 105: *V. maasi* probably identical with *V. anadyomene*; p. 106, Pl. 1, fig. 7, Pl. 3, figs. 27, 28: as *V. anadyomene*; Malayan Archipelago. STIASNY 1922*e*, p. 534, fig. 7: criticism of genus *Versura*; Siam. STIASNY 1926*b*, p. 256: as *Versura anadyomene* juv.? Australia. RAO 1931*a*, p. 46: as *Versura anadyomene*; Bay of Bengal. STIASNY 1931*b*, p. 36: as *Versura anadyomene*; Australia. BOONE 1938, p. 52, Pls. 8, 9: as *Versura palmata*; Malayan Archipelago.

‘ *Versura pinnata* ’ Haeckel 1880

Doubtful species.

HAECKEL 1880, p. 607: *Versura pinnata* n.sp.; Cocos Islands. MAYER 1910, p. 686: may be identical with *V. palmata*. STIASNY 1922*e*, p. 539: doubtful species.

‘ *Versura vesicata* ’ Haeckel 1880

Doubtful species.

HAECKEL 1880, p. 645: *Versura vesicata* n.sp.; N.W. coast of Australia. MAYER 1910, p. 686: ? identical with *V. palmata*. STIASNY 1922*e*, p. 539: doubtful species.

Family *THYSANOSTOMATIDAE*

Krikomyariae with very elongate, narrow, lash-like mouth-arms, triangular or three-winged in cross-section, without clubs or filaments.

Genus ***Thysanostoma*** L. Agassiz 1862

With the characters of the family; mouth-arms with or without naked, club-shaped extremities; eight rhopalar canals all with anastomoses; ring canal distinct.

Type-species: *T. thysanura* Haeckel.

L. AGASSIZ 1862, p. 153: *Thysanostoma* n.g. HAECKEL 1880, pp. 625, 627: as *Thysanostoma* and *Lorifera* n.g. MAYER 1910, pp. 691, 693: *Thysanostoma* and *Lorifera*. STIASNY 1940*a*, p. 24: *Lorifera* = *Thysanostoma*.

Thysanostoma flagellatum (Haeckel 1880)

55–200 mm wide, exumbrella finely granulated; 6–8 broadly rounded, well separated velar lappets without connecting membrane; mouth-arms terminate in a long, tapering, naked filament, about 2/3 as long as the lower arm itself; intracircular canal system fine-meshed with about 20 canal-roots in each octant.

HAECKEL 1880, p. 629: as *Himantostoma flagellata* n.sp.; Hawaiian Islands. MAYER 1910, p. 695: as *Lorifera flagellata*; Philippines. STIASNY 1929*c*, p. 204, fig. 4: as *L. flagellata*; Malayan Archipelago. STIASNY 1938, p. 27: comparison with *T. thysanura* and *lorifera*. STIASNY 1940*a*, p. 25: *Thysanostoma flagellata*; N. of Borneo. RANSON 1945*b*, p. 319: Hawaiian Islands.

Thysanostoma loriferum (Ehrenberg 1835)

Up to 200 mm wide, exumbrella smooth or finely granulated; 6–8 velar lappets in each octant, united by a membrane; mouth-arms terminate in a short, oval, naked knob; perradial rhopalar canals; intracircular canal system fine-meshed, with up to 30 canal-roots in each octant.

EHRENBERG 1835, p. 260: as *Rhizostoma lorifera* n.sp.; Red Sea. HAECKEL 1880, p. 628, Pl. 38, figs. 1–6: as *Himantostoma lorifera*; p. 628: as *Lorifera arabica* n.sp.; Red Sea. SCHULTZE 1897, p. 153, Pl. 15, figs. 1, 1*a*, 6: as *H. loriferum* var. *pacifica*; Malayan Archipelago. MAYER 1910, p. 694: as *L. lorifera*; p. 695: as *L. lorifera* 'var.' *pacifica*. MAYER 1915*a*, p. 197: as *L. lorifera* var. *pacifica*; Philippines. MAYER 1917*a*, p. 229: as *L. lorifera* var. *pacifica*; Philippines. STIASNY 1922*c*, p. 72: examination of the original specimen; as *H. lorifera* var. *pacifica*. STIASNY 1923*b*, p. 238, figs. 4, 5: examination of Ehrenberg's original specimen; as *H. lorifera*; p. 241: *H. lorifera* var. *pacifica* a local variety of *H. lorifera*. STIASNY 1924*a*, p. 493: as *L. lorifera*; Malayan Archipelago. STIASNY 1935, p. 35, Pl. 1, figs. 1, 2: as *L. lorifera*; Malayan Archipelago. STIASNY 1937*b*, p. 207: as *L. lorifera*. STIASNY 1938, p. 23, Pl. 2, figs. 7, 8, text-fig. D: as *L. lorifera*; p. 28, Pl. 2, fig. 9, text-fig. F: juv. of *L. lorifera*; Red Sea. STIASNY 1940*a*, p. 24, Pl. 2, figs. 4, 5: *Thysanostoma lorifera*; Philippines. RANSON 1945*b*, p. 319: Amboina, Malayan Archipelago.

Thysanostoma thysanura Haeckel 1880

100–120 mm wide, exumbrella with polygonal network of nematocysts; velar lappets well separated, without a connecting membrane, shape, size and number variable; arm-disk with numerous short, slender filaments; mouth-arms without a naked terminal portion; intracircular canal system with comparatively large, open meshes.

HAECKEL 1880, p. 625, Pl. 39, figs. 1–9: *Thysanostoma thysanura* n.sp.; Australia. KISHINOUYE 1910, p. 23: *T. thysanura*, different from *T. denscripsum* Kishinouye 1895; Japan. MAYER 1910, p. 692, text-fig. 420; = *T. denscripsum* Kishinouye; (Malay Archipelago; Amboina); Philippines; (from Moluccas to Japan). MAYER 1915*a*, p. 197: Philippines. MAYER 1917*a*, p. 227, fig. 24: Philippines. STIASNY 1920, p. 224: Malayan Archipelago. LIGHT 1921, p. 45: Philippines. STIASNY 1921*b*, p. 111, Pl. 1, fig. 6, Pl. 3, figs. 22, 23, text-figs. 5, 6: Malayan Archipelago. STIASNY 1922*c*, p. 71: Australia. STIASNY 1924*a*, p. 493: Malayan Archipelago. STIASNY 1929*c*, p. 202, figs. 2, 3: Malayan Archipelago. RAO 1931*a*, p. 47: Indian Ocean. STIASNY 1935, p. 35: Malayan Archipelago. STIASNY 1937*b*, p. 207. STIASNY 1938, p. 27: diagnosis. STIASNY 1940*a*, p. 25, Pl. 2, figs. 6, 7: north of Borneo. RANSON 1945*b*, p. 319: Amboina, Malayan Archipelago. UCHIDA 1947*b*, p. 343: Japan. UCHIDA 1954, pp. 209–19: Japan.

Suborder ***DAKTYLIOPHORAE***

Mouth-arms three-winged. A network of anastomosing canals, issuing from the primary ring canal, does not communicate with the gastral cavity except through the radial canals. Subumbrellar muscles annular. Rhopalar pits with radial folds. Subgenital ostia narrowed by papillae.

Inscapulatae

Dactyliophorae without scapulets; with permanent ring canal; with 16 or 32 radial canals not all extending to umbrella margin; with a continuous genital porticus.

Family *LYCHNORHIZIDAE*

Inscapulatae with centripetal, usually blindly ending and not anastomosing canals between the 16 radial canals; with broad, much folded mouth-arms.

Genus ***Anomalorhiza*** Light 1921

Lychnorhizidae with mouth-arms each with an axial terminal club.

Type-species: *A. shawi* Light.

LIGHT 1921, p. 33: *Anomalorhiza* n.g. STIASNY 1924*b*, p. 47: *Anomalorhiza* is referred to *Lychnorhiza*.

Anomalorhiza shawi Light 1921

600 mm wide, flat, exumbrella with low, wart-like projections in central part; in each octant six velar lappets, slightly convex, the two lateral smaller; mouth-arms branched only near the tip, the entire outer surface quite bare; mouths surrounded by tiny filaments; near centre of disk very small, slender filaments; each arm terminates in a long, slender club; inter-rhopalar canals end at ring canal; between the 16 radial canals only one intracircular canal.

LIGHT 1921, p. 33, figs. 1–3: *Anomalorhiza shawi* n.g., n.sp.; Philippines. STIASNY 1924*b*, p. 47: *A. shawi* is referred to *Lychnorhiza.*

Genus ***Lychnorhiza*** Haeckel 1880

Mouth-arms three-winged, without axial terminal clubs, with or without filaments; eight radial canals reaching bell margin, eight only reaching ring canal; in each of the 16 spaces 2–4 centripetal vessels.

Type-species: *L. lucerna* Haeckel.

HAECKEL 1880, pp. 587, 633: as *Lychnorhiza* n.g. and *Cramborhiza* n.g. MAYER 1910, p. 672: *Lychnorhiza.*

Lychnorhiza arubae Stiasny 1920

230 mm wide, exumbrella with numerous ribs radiating from apex towards margin; eight (2 × 4) pointed velar lappets in each octant; arm-disk with short filaments; mouth-arms as long as disk radius, widely separated from each other, with few short filaments; rhopalar radial canals broad, inter-rhopalar narrower, two centripetal canals between adjacent radial canals.

STIASNY 1920, p. 225: *Lychnorhiza arubae* n.sp.; Malayan Archipelago. STIASNY 1921*b*, p. 120, Pl. 2, fig. 8: Malayan Archipelago.

Lychnorhiza lucerna Haeckel 1880

120–150 mm wide, flatter than a hemisphere, exumbrella with fine granules and minute, sharp-pointed projections; four large velar lappets in each octant; mouth-arms as long as diameter of bell, much folded, the numerous mouths surrounded by minute clubs and numerous long filaments; two centripetal vessels between adjacent radial canals.

HAECKEL 1880, p. 587, Pl. 34, eight figs.: *Lychnorhiza lucerna* n.g., n.sp.; Brazil; p. 646: as *Cramborhiza flagellata*; Brazil. MAYER 1910, p. 673: synonyms: *C. flagellata* (young specimen) and *L. flagellata* Vanhöffen 1888. STIASNY 1921*b*, p. 119: =*C. flagellata* and *L. flagellata.* STIASNY 1923*b*, pp. 235, 237: Rio de Janeiro, Brazil (a specimen, determined by Haeckel *Cephea polynema* n.sp.). RANSON 1945*b*, p. 319: French Guiana, South America. VANNUCCI 1951*a*, p. 94, Pl. 4, figs. 25–7: Brazil. VANNUCCI 1954, p. 128: Brazil. KRAMP 1955*b*, p. 167: by Haeckel 1880 determined as *Cramborhiza flagellata.* VANNUCCI 1957*a*, pp. 594–6: Brazil.

Lychnorhiza malayensis Stiasny 1920

100 mm wide, exumbrella partly smooth, partly with irregular network of nematocysts; eight (2 × 4) pointed velar lappets in each octant; mouth-arms about as long as diameter of disk, without any appendages; four blind centripetal canals between adjacent radial canals.

STIASNY 1920, p. 226: *Lychnorhiza malayensis* n.sp.; Malayan Archipelago. STIASNY 1921*b*, p. 122, Pl. 2, fig. 9: Malayan Archipelago. MENON 1930, p. 17, Pl. 2, figs. 8*a–c*: Madras, India. STIASNY 1932, pp. 89–95, figs. 1–4: Batavia, Java. NAIR 1951, p. 74: Trivandrum coast, India.

Genus ***Pseudorhiza*** von Lendenfeld 1882

Mouth-arms with very long terminal clubs, with or without filaments between the mouths; eight radial canals reaching bell margin, eight only reaching ring canal; in each of the 16 spaces 10 centripetal unbranched, blind vessels.

Type-species: *P. aurosa* von Lendenfeld.

VON LENDENFELD 1882*b*, p. 380: *Pseudorhiza* n.g. MAYER 1910, p. 682.

Pseudorhiza aurosa von Lendenfeld 1882

400 mm wide, about 130 mm high, flatly rounded, exumbrella rough; in each octant six velar lappets, each consisting of three secondary lappets; mouth-arms without filaments.

VON LENDENFELD 1882*b*, p. 380: *Pseudorhiza aurosa* n.g., n.sp.; South Australia. MAYER 1910, p. 682. STIASNY 1921*b*, p. 123: discussion. STIASNY 1931*a*, p. 148, fig. 1: examination of original specimens; discussion. SOUTHCOTT 1958, fig. 2B.

Pseudorhiza haeckeli Haacke 1884

200–250 mm wide, 50–100 mm high; exumbrella rough; in each octant six wide, short, rounded velar lappets; each leaf of the three-winged mouth-arms with many flat, fern-like expansions; a single very long filament arises from the distal end of one of the mouth-arms.

HAACKE 1884, p. 291: *Pseudorhiza haeckelii* n.sp.; South Australia. MAYER 1910, p. 683. STIASNY 1921*b*, p. 123: discussion. THIEL 1926, pp. 223–47, Pl. 3: S.W. Australia. SOUTHCOTT 1958, p. 58, fig. 2C: ? = *P. annaskala* von Lendenfeld.

Family *CATOSTYLIDAE*

Inscapulatae with intracircular network of anastomosing canals communicating with the ring canal, but not always with the 16 radial canals; the eight rhopalar canals extending to the umbrella margin, the eight interrhopalar only to the ring canal; mouth-arms pyramidal.

Genus **Acromitoides** Stiasny 1921

With a broad intracircular anastomosing network in direct communication with the ring canal and the inter-rhopalar canals only; mouth-arms without appendages.

Type-species: *A. stiphropterus* (Schultze).

Schultze 1897, p. 159: as *Crambessa* in part. Mayer 1910, pp. 670, 671: as *Catostylus* in part. Stiasny 1921*b*, p. 136: *Acromitoides* n.g.

Acromitoides purpurus (Mayer 1910)

115 mm wide, 35 mm high, exumbrella smooth; in each octant four cleft and two simple velar lappets (two median and two lateral lappets are cleft); mouth-arms shorter than radius of bell, lower three-winged portion 5–7 times as long as upper cylindrical portion; uniform dark brownish-purple.

Mayer 1910, p. 671, text-fig. 412: as *Catostylus purpurus* n.sp.; Philippines. Light 1914*b*, p. 207: as *C. purpurus*; Philippines. Mayer 1915*a*, p. 187: as *C. purpurus*; Philippines. Mayer 1917*a*, p. 213, fig. 15: as *C. purpurus*. Light 1921, p. 41: as *C. purpurus*; Philippines. Stiasny 1921*b*, p. 136: *Acromitoides purpurus* n.g. Stiasny 1924*b*, p. 39, fig. 1: Philippines. Chiu 1954*b*, p. 56: as *Catostylus purpurus*.

Acromitoides stiphropterus (Schultze 1897)

100 mm wide, smooth; in each octant at least five large, cleft velar lappets, 10 mm long; mouth-arms shorter than radius of bell, distal three-winged portion five times as long as proximal cylindrical portion; exumbrella with four perradial areas of brown spots.

Schultze 1897, p. 159, Pl. 15, figs. 4, 5, 5*a*: as *Crambessa stiphropterus* n.sp.; Ternate, Malayan Archipelago. Mayer 1910, p. 670: as *Catostylus stiphropterus*. Stiasny 1921*b*, p. 136: *Acromitoides stiphropterus* n.g.

Genus **Acromitus** Light 1914

With a broad intracircular anastomosing network in direct communication with the ring canal and the rhopalar canals only (not with the inter-rhopalar canals); mouth-arms each with a terminal whip-like appendage, usually with whip-like filaments (except in *A. hardenbergi*).

Type-species: *A. maculosus* Light.

Light 1914*b*, p. 212: *Acromitus* n.g.

Acromitus flagellatus (Maas 1903)

120 mm in diameter; exumbrella smooth or finely granulated; the subgenital papillae hammer- or heart-shaped; mouth-arms about as long as diameter of bell, narrow, with long, thread-like endings with short filaments; intracircular anastomosing network richly branched.

MAAS 1903, p. 77, Pl. 10, figs. 87–92, Pl. 11, fig. 101: as *Himantostoma flagellata*; Malayan Archipelago. MAYER 1910, p. 695: as *Lorifera flagellata*, including *H. flagellata* Haeckel 1880 and Maas 1903. MAYER 1915*a*, p. 191, fig. 6: as *Lychnorhiza bornensis* n.sp.; Borneo. MAYER 1917*a*, p. 218, fig. 19: as *L. bornensis*; Borneo. STIASNY 1920, p. 226: *Acromitus flagellatus* =*H. flagellata* Maas 1903, non Haeckel 1880. STIASNY 1921*b*, p. 131, Pl. 2, fig. 10, Pl. 4, fig. 30, Pl. 5, fig. 40, text-figs. 7–9: Malayan Archipelago; pp. 120, 135: =*L. bornensis* Mayer 1915. STIASNY 1922*e*, p. 546, figs. 10–12: Siam; Java. STIASNY 1929*c*, p. 210, figs. 11–15: Malayan Archipelago. RAO 1931*a*, p. 48: Indian Ocean. STIASNY 1931*a*, p. 161: Malayan Archipelago. STIASNY 1934*b*, p. 5. STIASNY 1934*c*, pp. 8–10, figs.: anomalies; Batavia, Java. MAADEN 1935, pp. 228–36: =a variety of *A. maculosus*; Amoy, China. MENON 1936, p. 8: Krusadai Islands, Indian Ocean. GRAVELY 1941, p. 12, fig. 6: Madras, India. PATIL 1951, p. 132: as *Acromitus*; Karwar coast, India. UCHIDA 1954, pp. 209–19: Japan. UCHIDA 1955*a*, p. 16, figs. 1, 2: Formosa (Tai-wan).

Acromitus hardenbergi Stiasny 1934

About 90 mm wide; exumbrella almost smooth or finely granulated; subgenital papillae pear- or egg-shaped; mouth-arms a little longer than bell radius, with short whip-like filaments, but without thread-like endings; anastomosing network richly branched; with forked extracircular canals.

STIASNY 1934*b*, pp. 1–7, figs. 1–5: *Acromitus hardenbergi* n.sp.; Borneo. MAADEN 1935, p. 234: *A. hardenbergi* a variety of *A. maculosus*.

Acromitus maculosus Light 1914

90 mm wide; exumbrella with blunt, conical protuberances; subgenital papillae flap-like; mouth-arms 1·3 to two times the length of radius of bell, thick and broad, with long whip-like filaments and long thread-like endings; a few (no more than three) anastomoses inside the ring canal.

LIGHT 1914*b*, p. 212, figs. 4–6: *Acromitus maculosus* n.g., n.sp.; Philippines. STIASNY 1934*b*, p. 5. MAADEN 1935, p. 233: only species of *Acromitus*.

Acromitus rabanchatu Annandale 1915

200 mm wide, exumbrella finely granulated; subgenital papillae broad, triangular cones with blunt tips; mouth-arms up to twice the length of radius of bell, with short whip-like filaments and long thread-like endings; a few (no more than three) faintly branched anastomoses inside the ring canal.

ANNANDALE 1915, p. 96: *Acromitus rabanchatu* n.sp.; Chilka Lake, east coast of India. STIASNY 1925, p. 11, figs. 6–10. RAO 1931*a*, p. 49: Chilka Lake, India. STIASNY 1934*b*, p. 5. MAADEN 1935, p. 234: a variety of *A. maculosus*.

Acromitus tankahkeei Light 1924

44 mm wide; in the centre of the upper lip of each subgenital ostium is a granulate, pear-shaped protuberance with its swollen base towards the ex-

terior; this character and the colour separates the species from *A. maculosus*; mouth-arms nearly as long as bell diameter, slender, with short whip-like filaments and with long thread-like endings; anastomosing network inside the ring canal richly branched.

Light 1924, pp. 449–51, figs.: *Acromitus tankahkeei* n.sp.; China. Stiasny 1934*b*, p. 5. Maaden 1935, p. 234: a variety of *A. maculosus*. Chiu 1954*b*, pp. 50, 51: China.

Genus *Catostylus* L. Agassiz 1862

With a broad, intracircular anastomosing network in direct communication with both rhopalar and inter-rhopalar canals and with the ring canal; mouth-arms without special appendages.

Type-species: *C. mosaicus* (Quoy & Gaimard).

L. Agassiz 1862, pp. 152, 153: as *Catostylus* n.g. and *Rhacophilus* n.g. Haeckel 1869, p. 509: as *Crambessa* n.g. in part. Mayer 1910, p. 664: *Catostylus*.

Catostylus cruciatus (Lesson 1830)

120–150 mm wide; hemispherical with deep radiating furrows; in each octant four large triangular velar and two very small ocular lappets; mouth-arms one to 1·5 times the length of bell radius, distal three-winged portion four times as long as the proximal, simple portion.

Lesson 1830, p. 121, Pl. 11, fig. 1: as *Rhizostoma cruciata* n.sp.; Santa Catharina Island, coast of Brazil. L. Agassiz 1862, p. 153: as *Rhacophilus cruciatus* n.g. Haeckel 1880, p. 620: as *Crambessa cruciata*. Mayer 1910, p. 667: *Catostylus cruciatus*. Stiasny 1921*b*, p. 141: critical remarks. Vannucci 1957*a*, pp. 594–6: Brazil.

Catostylus mosaicus (Quoy & Gaimard 1824)

250–350 mm wide; exumbrella with coarse granulations; about 16 lappets in each octant, all alike; arm-disk somewhat wider than bell radius; mouth-arms about 1·5 times as long as bell radius, proximal portion 1/6 as long as the distal, tapering, three-winged portion; outer edges branch profusely and taper to a pointed end below; no appendages; intracircular network rather narrow, with nearly radial meshes, extracircular network very wide and fine-meshed, extending into the lappets.

Quoy & Gaimard 1824, p. 569, Pl. 85, fig. 3: as *Cephea mosaica* n.sp.; Australia. L. Agassiz 1862, p. 152: *Catostylus mosaicus* n.g. and as *C. wilkesii* n.sp. Haeckel 1880, p. 622: as *Crambessa mosaica*. Mayer 1910, p. 666: *Catostylus mosaicus*; (Australian coast from Brisbane to Melbourne). Mayer 1915*a*, pp. 160, 190: Queensland, Australia. Mayer 1917*a*, p. 215: Philippines. Stiasny 1921*b*, p. 139. Stiasny 1922*b*, p. 45, figs. 1, 2: a specimen from Australia, determined *Versura palmata* by Haeckel. Stiasny 1922*e*, p. 554: N.S.Wales, Australia. Stiasny 1924*c*, p. 66, fig. 5: Australia. Stiasny 1929*c*, p. 214: New Guinea. Stiasny 1931*a*, p. 154: Australia. Stiasny 1931*b*, p. 38: Australia. Pope 1953*b*, pp. 16–21: Australia.

Catostylus ornatellus (Vanhöffen 1888)

About 55 mm wide; flatly rounded, granular surface with lines over lappets; in each octant eight large, bluntly pointed velar and two small, sharp-pointed ocular lappets; mouth-arms 1/2 to 2/3 the length of bell radius, distal three-winged portion as long as proximal simple portion, without appendages; intracircular mesh-work of canals very broad, reaching inwards almost to the arm-disk, with very broad anastomoses.

VANHÖFFEN 1888, pp. 28, 41, Pl. 2, figs. 3–6: as *Loborhiza ornatella* n.g., n.sp.; coast of Ecuador. MAYER 1910, p. 670: *Catostylus ornatellus*. STIASNY 1921*b*, p. 142. STIASNY 1923*b*, p. 229, fig. 1: examination of the original specimen.

Catostylus perezi Ranson 1945

Up to 230 mm wide, central part of exumbrella smooth, with rows of prominent rugged papillae radiating towards the margin; in each octant 12–16 pointed velar lappets; mouth-arms about 1·5 times the length of bell radius, sub-cylindrical, distal three-winged portion about six times as long as the proximal simple portion; intracircular canal system with fairly open irregular meshes.

RANSON 1945*a*, pp. 236–42, figs. 1–5: *Catostylus perezi* n.sp.; Arabia. RANSON 1945*b*, p. 319. KRAMP 1956*b*, p. 241: Iranian Gulf.

Catostylus tagi (Haeckel 1869)

Up to 650 mm wide, with dendritically branching furrows; in each octant eight large, triangular velar and two small, pointed ocular lappets; mouth-arms as long as bell diameter, distal three-winged portion 3–4 times as long as proximal, simple portion, terminal end of mouth-arms pointed, naked; intracircular mesh-work of canals extraordinarily wide, with broad anastomoses; extracircular mesh-work very fine-meshed, extending into the lappets.

HAECKEL 1869, p. 509, Pls. 38, 39: as *Crambessa tagi* n.g., n.sp.; Portugal. HAECKEL 1880, p. 621: as *Crambessa tagi* and *pictonum* n.sp.; Atlantic coast of France. MAYER 1910, p. 668: *Catostylus tagi*, synonym *Crambessa pictonum* Haeckel? (from Senegambia, Africa, to France). VANHÖFFEN 1920, pp. 16, 17: as *Catostylus* sp.; West Africa. STIASNY 1921*b*, p. 142: *C. pictonum* doubtful species; remarks on *C. tagi*. STIASNY 1922*c*, p. 74, figs. 4, 5: *C. pictonum*. STIASNY 1922*e*, p. 541, fig. 8: *C. tagi*; Panama. STIASNY 1929*c*, p. 214: St Louis, north of Cape Verde. STIASNY 1930*d*, pp. 20–31, figs. 1, 7: mouth of Congo. STIASNY 1931*a*, p. 155: Spain; Portugal. STIASNY 1939*c*, p. 43: mouth of Congo. RANSON 1945*b*, p. 319: Bay of Biscay. RANSON 1945*c*, p. 71: *C. pictonum* = *C. tagi*; p. 72, Pl. 1, figs. 1–4: mouth of Loire, France. RANSON 1949, p. 144: discussion; Angola; Rio Ora, N.W. Africa. KRAMP 1955*a*, p. 303: Gulf of Guinea, W. Africa. KRAMP 1959*b*, p. 25: West Africa.

Catostylus townsendi Mayer 1915

100 mm wide, flatter than a hemisphere, finely granular, jelly of horny rigidity; number of lappets variable, velar lappets about twice as wide as

long, rhopalar lappets small and oval; deep clefts between lappets extend upwards; mouth-arms 2/3 of the length of diameter, distal three-winged portion 2–4 (up to seven) times as long as proximal simple portion, tapering to pointed distal ends; intracircular mesh-work with rather wide meshes, extracircular mesh-work fine-meshed, extending into the lappets.

MAYER 1915*a*, p. 188, fig. 5: *Catostylus townsendi* n.sp.; Borneo. MAYER 1917*a*, p. 214, fig. 16: Borneo. STIASNY 1920, p. 227: Malayan Archipelago. STIASNY 1921*b*, p. 144, Pl. 2, fig. 12, Pl. 4, fig. 31, Pl. 5, figs. 39, 47, text-fig. 10: Malayan Archipelago. STIASNY 1921*d*, p. 109, fig. 1: juvenile specimen; Malayan Archipelago. STIASNY 1922*e*, p. 545, fig. 9. STIASNY 1925, p. 5, figs. 1–5: Batavia, Java. STIASNY 1931*a*, p. 156: Batavia, Java. RANSON 1945*b*, p. 319: Indochina; Gulf of Siam. ?SEARLE 1957, p. 75, fig. 4*a*: as *C.* sp.

Catostylus tripterus (Haeckel 1880)

50 mm wide, hemispherical; in each octant four wide, quadratic velar and two narrow, long, projecting ocular lappets; mouth-arms as long as bell radius, distal three-winged portion half as long as proximal, simple portion.

HAECKEL 1880, p. 586: as *Toxoclytus tripterus* n.sp.; Fernando Po, W. Africa. MAYER 1910, p. 671: *Catostylus tripterus*. STIASNY 1921*b*, p. 143: probably to *Catostylus*, but doubtful species.

Catostylus viridescens (Chun 1896)

80 mm wide, hemispherical, smooth; lappets?; mouth-arms as long as bell radius, distal three-winged portion five times as long as proximal simple portion; terminal ends bluntly rounded.

CHUN 1896, p. 12, Pl. 1, fig. 2: as *Crambessa viridescens* n.sp.; mouth of Pangani River, E. Africa. MAYER 1910, p. 670: *Catostylus viridescens*. STIASNY 1921*b*, p. 142: doubtful species. STIASNY 1922*b*, p. 49: Zanzibar.

Genus ***Crambione*** Maas 1903

With a narrow, wide-meshed, intracircular anastomosing mesh-work, not stretching far towards the centre and communicating only with the ring canal; mouth-arms with clubs and whip-shaped filaments; without terminal clubs.

Type-species: *C. mastigophora* Maas.

MAAS 1903, pp. 48, 81: *Crambione* n.g. MAYER 1910, pp. 674, 676: as *Lychnorhiza* in part, and *Crambione*.

Crambione bartschi (Mayer 1910)

74 mm wide, smooth, thick but not very rigid; 10 bluntly pointed velar lappets in each octant; mouth-arms with numerous simple, flattened, tapering filaments between the mouths; mouth-arms about as long as bell radius,

distal three-winged portion about twice as long as proximal simple portion; extracircular network of canals not extending into the velar lappets, intracircular system with almost quadratic meshes.

MAYER 1910, p. 674, text-figs. 413, 414: as *Lychnorhiza bartschi* n.sp.; Philippines. MAYER 1915*a*, p. 191: as *L. bartschi*; Philippines; Celebes. MAYER 1917*a*, p. 217, figs. 17, 18: as *L. bartschi*. STIASNY 1921*b*, pp. 120, 126: belongs to *Crambione*, possibly =*C. mastigophora*.

Crambione cooki Mayer 1910

110 mm, hemispherical, tough; smooth in flexible zone above margin, central inflexible part reticulated by deep, more or less radial furrows; in each octant 11 (9+2) large, pointed lappets, all alike; mouth-arms about 3/4 the length of diameter, lower 2/3 three-winged, complexly folded; four slender filaments (as long as bell radius) from arm-disk; 2–6 globular appendages on outer side of each mouth-arm; canal system?

MAYER 1910, p. 677, Pl. 74, fig. 2: *Crambione cooki* n.sp.; Great Barrier Reef, E. Australia. STIASNY 1921*b*, p. 125: systematic position uncertain.

Crambione mastigophora Maas 1903

400 mm wide, highly arched, exumbrella smooth; in each octant 8–10 velar lappets, elongate, with rounded outer edges and deep clefts; arm-disk very wide; mouth-arms about as long as bell radius, distal three-winged portion as long as proximal simple portion; distal portion pyramidal, with many small club-shaped and some long filamentous appendages; extracircular canal system fine-meshed, not extending into the velar lappets; intracircular system with comparatively few meshes, partly elongated, radiating.

MAAS, 1903, p. 49, Pl. 6, figs. 47–53, Pl. 8, figs. 71–4, Pl. 11, figs. 100, 104, Pl. 12, fig. 113: *Crambione mastigophora* n.g., n.sp.; Malayan Archipelago. MAYER 1910, p. 676. STIASNY 1920, p. 226: Malayan Archipelago. STIASNY 1921*b*, p. 127, Pl. 2, fig. 11, Pl. 4, fig. 29, Pl. 5, fig. 45: Malayan Archipelago. STIASNY 1924*a*, p. 495, figs. 4–7: Malayan Archipelago. STIASNY 1929*c*, p. 207, figs. 5–10: Malayan Archipelago. STIASNY 1931*a*, p. 154: Ceylon. STIASNY 1935, p. 37, fig. 9: Malayan Archipelago. STIASNY 1937*b*, p. 207. UCHIDA 1947*a*, p. 318: Truk Islands, central Pacific.

Genus **Crambionella** Stiasny 1921

With a narrow, wide-meshed, intracircular anastomosing network, not stretching far towards the centre, and communicating only with the ring canal; mouth-arms with short terminal clubs, but without whip-like filaments.

Type-species: *C. orsini* (Vanhöffen).

VANHÖFFEN 1888, p. 34: as *Mastigias* in part. MAYER 1910, p. 669: as *Catostylus* in part. STIASNY 1921*b*, p. 129: *Crambionella* n.g.

Crambionella annandalei Rao 1931

Differs from *C. stuhlmanni* ' only in the great length of the terminal club and its tapering form and in having small foliaceous appendages among the mouth-frills '.

MENON 1930, p. 18, Pl. 3, figs. 14*a*, *c*, *e*: as *C. stuhlmanni*?; Madras, India. RAO 1931*a*, p. 50, Pl. 3, Pl. 4, fig. 1, text-figs. 4–8: *Crambionella annandalei* n.sp.; India; Burma. STIASNY 1937*a*, p. 236: doubtful species.

Crambionella orsini (Vanhöffen 1888)

100–200 mm wide, plump, massive, hard and cartilaginous, smooth; in each octant 16 small, sharp-pointed, smooth velar lappets, separated by furrows extending upwards on exumbrella, furrows without pigment; mouth-arms about as long as bell radius, proximal portion short, 1/3 as long as distal three-winged portion, which is large, prismatic, with a short gelatinous, pyramidal, bluntly pointed, three-cornered terminal knob; extra-circular canal system with several radial vessels.

VANHÖFFEN 1888, pp. 34, 44, Pl. 4, figs. 2–4: as *Mastigias orsini* n.sp.; Red Sea. MAYER 1910, p. 669: as *Catostylus orsini*. STIASNY 1921*b*, p. 129: *Crambionella* n.g. *orsini*. STIASNY 1923*b*, p. 232, figs. 2, 3: examination of type-specimen. MENON 1930, p. 18, Pl. 3, figs. 14*b*, *d*: Madras, India. MENON 1936, p. 7, Pl. 1, figs. 1, 3: Krusadai Islands, Indian Ocean. STIASNY 1937*a*, p. 231, Pl. 1, figs. 4, 5, text-figs. 12–14: Arabian Sea. STIASNY 1938, p. 31: Red Sea. RANSON 1945*b*, p. 319: Pondichery, east coast of India. NAIR 1946, p. 97: Travancore, India. NAIR 1951, p. 75: Travancore, India. KRAMP 1956*b*, p. 241: Iranian Gulf.

Crambionella stuhlmanni (Chun 1896)

80–200 mm wide; in each octant 12 velar lappets, each provided with a median row of sharp-pointed projections; mouth-arms shorter than bell diameter, with a short, pyramidal, bluntly pointed, three-cornered terminal knob.

CHUN 1896, p. 10, Pl. 1, two figs.: as *Crambessa stuhlmanni* n.sp.; East Africa. MAYER 1910, p. 669: *Catostylus stuhlmanni*. STIASNY 1921*b*, p. 129: *Crambionella stuhlmanni* STIASNY 1922*b*, p. 50, fig. 3: as '*Crambessa*' *stuhlmanni*; Mozambique, S.E. Africa. STIASNY 1937*a* , p, 237: a valid species. RANSON 1945*b*, p. 319: Madagascar.

Genus ***Leptobrachia*** Brandt 1838

The long, linear mouth-arms bear no frilled mouths near the middle of their length; but near their points of origin from the arm-disk there is a ventral row of mouths, and beyond the naked mid-region there are three lines of mouths, one ventral and two dorsal; mouth-arms terminate in a naked, pointed end. Doubtful genus.

Type-species: *L. leptopus* (Chamisso & Eysenhardt).

BRANDT 1838*b*, p. 191: *Leptobrachia* n.g. HAECKEL 1880, pp. 630, 631: *Leptobrachia* and as *Leonura* n.g. MAYER 1910, p. 696: *Leptobrachia.*

Leptobrachia leptopus (Chamisso & Eysenhardt 1821)

80 mm wide, flatter than a hemisphere, exumbrella with regularly arranged polygonal elevations (caused during collecting by pressure of the net?); in each octant 8+2 sharply pointed lappets, the largest in the middle, converging furrows from the clefts upwards; mouth-arms about as long as bell diameter, slender, terminating in a triangular, pointed, naked extremity, 1/4 as long as entire mouth-arm. Doubtful species.

CHAMISSO & EYSENHARDT 1821, p. 356, Pl. 27, figs. 1A, D: as *Rhizostoma leptopus* n.sp.; Radack Islands, tropical Pacific. BRANDT 1838*b*, p. 191: *Leptobrachia leptopus* n.g. HAECKEL 1880, pp. 631, 646: as *Leonura leptura* n.g., n.sp. and *Leonura terminalis*; near New Zealand. MAYER 1910, p. 696: *Leptobrachia leptopus, =Leonura leptura* and *terminalis* Haeckel. STIASNY 1921*b*, pp. 117, 118: both genus and species doubtful; p. 147: *Leonura terminalis* doubtful species, nearest related to *Catostylus.* STIASNY 1931*a*, p. 156, fig. 2: *L. terminalis =Leptobrachia leptopus*; belongs to Catostylidae.

Family *LOBONEMATIDAE*

Inscapulatae with intracircular network of anstomosing canals communicating with the ring canal and with some or all of the 16–32 radial canals, but not with the stomach; with window-like openings in the membranes of the mouth-arms; marginal lappets elongated, tentacle-like.

Genus ***Lobonema*** Mayer 1910

With a large-meshed, intracircular anastomosing network, which communicates with both rhopalar and inter-rhopalar canals and with the ring canal.

Type-species: *L. smithi* Mayer.

MAYER 1910, p. 688: *Lobonema* n.g.

Lobonema mayeri Light 1914

500 mm wide; differs from *L. smithi* in that it has 12–16 rhopalia instead of eight, in that the circular muscle is completely interrupted in the ocular radii, in that it has a false ostium in each interostial pillar, and in that the inter-rhopalar canals do not reach the bell margin; probably=*L. smithi.*

LIGHT 1914*b*, p. 217, figs. 7, 8, 9: *Lobonema mayeri* n.sp.; Philippines. LIGHT 1921, p. 43: uncertain that *L. mayeri* differs from *smithi*. STIASNY 1921*b*, p. 150: two species of *Lobonema*: *smithi* and *mayeri*. RAO 1931, p. 56: *L. mayeri* probably = *smithi*. THIEL 1935*a*, p. 6: *L. mayeri* = *smithi*; poisonous effect. RANSON 1945*b*, p. 320: Indochina.

Lobonema smithi Mayer 1910

236 mm wide, thick, tough, and rigid; exumbrella with erect, gelatinous papillae, largest and most abundant at centre, about 35–40 mm long, pointed, with nematocysts; four velar lappets in each octant, 90–100 mm long, tapering, pointed; mouth-arms 150 mm long, distal three-winged portion 1½ times as long as proximal portion; numerous long spindle-shaped and thread-like appendages; 16 radial canals.

MAYER 1910, p. 689, text-figs. 417, 418: *Lobonema smithi* n.g., n.sp.: Philippines. LIGHT 1914*b*, p. 217, figs. 7–9: as *L. mayeri* n.sp. Philippines. MAYER 1915*a*, p. 196: *L. smithii*; Philippines. MAYER 1917*a*, p. 224, figs. 22, 23: Philippines. LIGHT 1921, p. 43: as *L. mayeri*; p. 44: *L. smithi*; Philippines. STIASNY 1921*b*, p. 150: two species of *Lobonema*: *smithi* and *mayeri*. RAO 1931*a*, p. 56: Indian Ocean. THIEL 1935*a*, p. 6: *L. mayeri* synonym of *smithi*. SOUTHCOTT 1959, p. 575.

Genus **Lobonemoides** Light 1914

With a large-meshed, intracircular anastomosing network, which communicates only with the rhopalar canals and the ring canal.

Type-species: *L. gracilis* Light.

LIGHT 1914*b*, p. 222: *Lobonemoides* n.g.

Lobonemoides gracilis Light 1914

50–85 mm wide, transparent; exumbrella with a few scattered, small, slender papillae, up to 2 mm long; 14 rhopalia, 28 radial canals, all reaching the margin; four large pointed triangular velar lappets between two small ocular.

(The short marginal lappets, the simple structure of the canal system, the lack of subgenital papillae and of windows in the mouth-arms suggests that *L. gracilis* is a younger stage of *L. robustus*.)

LIGHT 1914*b*, p. 222, figs. 10–13: *Lobonemoides gracilis* n.g., n.sp. Philippines. MAYER 1915*a*, p. 196: ? = *Lobonema mayeri* juv. MAYER 1917*a*, p. 224: ? = *L. mayeri* juv. STIASNY 1921*b*, p. 156: probably = *Lobonemoides robustus* juv. STIASNY 1924*b*, p. 45: may be = *L. robustus*; not to *Lobonema*.

Lobonemoides robustus Stiasny 1920

160–320 mm wide, faintly arched, central portion very thick, margin thin, exumbrella with pointed papillae, 15–30 mm long; 11–21 rhopalia; velar lappets up to 95 mm long with slender, thread-like extremities, 1–6 between adjacent rhopalia; mouth-arms broad, three-winged, up to 145 mm long, each with 1–4 window-like openings and with filaments up to 130 mm long, and a long spindle-shaped terminal appendage; 20–34 radial canals, inter-rhopalar canals effaced beyond ring canal.

STIASNY 1920, p. 227: *Lobonemoides robustus* n.sp.; Malayan Archipelago. STIASNY 1921*b*, p. 151, Pl. 2, fig. 13, Pl. 4, fig. 32, Pl. 5, figs. 41–4, text-figs. 11–14: Java. STIASNY 1924*b*, p. 45: Manila, Philippines.

Lobonemoides sewelli Rao 1931

260 mm wide, central portion of exumbrella with some scattered papillae; tongue-shaped thickenings at base of velar lappets; 16 rhopalia; between adjacent rhopalia 2–6 velar lappets, elongately triangular, 10–15 mm long; mouth-arms 90–155 mm, with window-like openings, without filamentous appendages, but with short, stiff, rod-like appendages scattered amongst the mouths; 16 rhopalar canals reaching margin, 16 inter-rhopalar only to ring canal.

RAO 1931*a*, p. 57, figs. 9–13: *Lobonemoides sewelli* n.sp.; Mergui Archipelago, Indian Ocean.

Scapulatae

Dactyliophorae with eight pairs of scapulets on upper arms; with or without ring canal; with 16 radial canals all extending to umbrella margin; with four separated subgenital cavities.

Family *RHIZOSTOMATIDAE*

Scapulatae with mouth-arms coalesced in proximal portion only; without a primary mouth opening; manubrium with a complicated canal system; distal portion of arms three-winged, usually with a terminal club.

Genus ***Eupilema*** Haeckel 1880

Without filaments, clubs or other appendages (torn off?), without a terminal club.

Type-species: *E. scapulare* Haeckel.

HAECKEL 1880, p. 590: *Eupilema* n.g. MAYER 1910, p. 709. STIASNY 1921*b*, p. 169: probably =*Rhopilema*.

Eupilema scapulare Haeckel 1880

Doubtful species; probably a damaged specimen of *Rhopilema*. 150 mm wide, 50 mm high.

HAECKEL 1880, pp. 582, 590: *Eupilema scapulare* n.g., n.sp.; Sunda Archipelago and Sumatra. MAYER 1910, p. 709. STIASNY 1920, p. 229: Japan. STIASNY 1921*b*, p. 169: probably a damaged specimen of *Rhopilema esculenta*.

Genus ***Rhizostoma*** Cuvier 1800

Rhizostomatidae with small scapulets and short manubrium; mouth-arms without secondary clubs nor filaments, but each with a single, club-like terminal appendage; usually with a ring canal; intracircular network of canals with few and large meshes.

Type-species: *R. pulmo* (Macri).

CUVIER 1800, p. 69, Pl. 4: *Rhizostome* n.g. PÉRON & LESUEUR 1809, p. 362: *Rhizostoma*. HAECKEL 1880, p. 591: as *Pilema* n.g. MAYER 1910, p. 698.

Rhizostoma luteum (Quoy & Gaimard 1827)

Up to 300 mm wide; differs from *R. pulmo* in the proximal portion of the mouth-arms being considerably longer and stronger than the distal portion and throughout most of its length coalesced into a thick manubrium; the distal portion of the arms remarkably small, the terminal appendage with club-shaped extremity on a long, thin, prismatic pedicel. Subgenital papillae an isolated, egg-shaped or bean-shaped protuberance in the bottom of each subgenital pit.

QUOY & GAIMARD 1827, p. 175, Pl. 4B, fig. 1: as *Orithyia lutea* n.sp.; Straits of Gibraltar. ESCHSCHOLTZ 1829, p. 51: *Rhizostoma lutea*. MAYER 1910, p. 703: as *R. pulmo* var. *lutea*. STIASNY 1921*b*, p. 159: a valid species. STIASNY 1931*a*, p. 164, figs. 4–6: *R. luteum*; off coast of Portugal. STIASNY 1936, pp. 1–6, figs. 1, 2: Tejo, Lisbon. RANSON 1949, p. 147: discussion; Angola; Mauretania. KRAMP 1955*a*, p. 304: Gulf of Guinea, W. Africa. KRAMP 1959*b*, p. 26, fig. 5: West Africa.

Rhizostoma pulmo (Macri 1778)

Occasionally up to 600 mm wide, usually highly arched, thick and rigid, exumbrella finely granulated; 8–12 small velar lappets per octant; total length of mouth-arms about equal to disk diameter, proximal portion about as long as distal three-winged portion, terminal clubs about 1/3 of the total length of the arms, triangular in cross-section; subgenital papillae represented by a thickened valve on the outer edge of each subgenital pit.

Rhizostoma pulmo forma *typica*: 8–9 velar lappets in each octant; proximal portion of mouth-arms somewhat longer than distal three-winged portion; terminal clubs widest near their bases.

Rhizostoma pulmo var. *octopus*: 11–12 velar lappets in each octant, more pointed than in f. *typica*; proximal portion of mouth-arms somewhat shorter than distal three-winged portion; terminal clubs widest near their ends.

MACRI 1778*b*, p. 45, Pl. 1: as *Medusa pulmo* n.sp.; Mediterranean. L. AGASSIZ 1862, p. 150: *Rhizostoma pulmo*. HAECKEL 1880, p. 591: as *Pilema pulmo*. MAYER 1910,

p. 699, Pl. 73, text-fig. 422: synonyms; (Naples, Mediterranean): p. 703: as *R. pulmo* var. *octopus*; (France to Germany, Scotland); p. 703: as *R. pulmo* var. *corona*; (Red Sea); p. 703: as *R. pulmo* var. *capensis*; (South Africa). JORDAN 1912, p. 127: as *R. octopus*. HAUROWITZ 1920, pp. 28–37: as *R. cuvieri*; Trieste, Adriatic Sea. STIASNY 1920, p. 228: as *R. octopus*; Holland; p. 228: *R. pulmo*; St Nazaire, France. SCHAEFER 1921, pp. 49 ff.: as *Rhizostoma*; experiments. STIASNY 1921*b*, p. 160, Pl. 2, fig. 14, Pl. 4, fig. 33: as *R. octopus*; Holland; p. 161: *R. pulmo*; Bay of Biscay. ANSELMI 1923, p. 73: *Rizosthoma pulmo*; Mediterranean. ELMHIRST 1923, p. 22: Clyde Sea area, Scotland. FREINKEL 1925, pp. 658 ff.: experiments. SCHODDUYN 1926, p. 40: as *R. cuvieri*; Pas de Calais, English Channel. SLONIMSKI 1926, pp. 926, 927, one fig.: Villefranche-sur-Mer, France. SCHODDUYN 1927, p. 26: as *Rhizostoma*. STIASNY 1928*a*, pp. 177, 184, 189, figs. 1–5, 6–8, 1–10: as *R. octopus*; North Sea. STIASNY 1929*b*, pp. 4–15, Pls. 1–9: as *R. octopus*; anomalies in the gastrovascular system. STIASNY 1930*a*, p. 24, Pl. 2, figs. 10–12: as *R. octopus*; Belgium. MAR. BIOL. ASS. 1931, p. 86: as *R. octopus*; Plymouth. NOBRE 1931, p. 27: Portugal. STIASNY 1931*a*, p. 161, fig. 3: *R. pulmo*, comparison with *R. octopus*; Naples. BENAZZI 1933, pp. 212, 213: observations in aquaria. BERNTROP 1934, p. 2084: as *R. octopus*; coast of Holland. KRAMP 1934*a*, pp. 211–21: as *R. octopus*; Denmark. KRAMP 1934*b*, pp. 234–40, fig. 2: as *R. octopus*; Denmark. WEILL 1934*b*, p. 545, figs.: as *R. octopus*; nematocysts. THIEL 1935*a*, p. 4, fig. 3: poisonous effect. LAMBERT 1936, p. 71: Essex coast, England. KRAMP 1937*b*, p. 192, figs. 83–5: Denmark. ?KÜNNE 1937*b*, p. 5: as *R. octopus*; Western Baltic. PASPALEFF 1938*a*, pp. 1–25, figs.: Black Sea. VERESS 1938, pp. 153–70: as *Rhizostoma*; movements. NETCHAEFF & NEU 1940, p. 63: as *Pilema pulmo*; Black Sea. TAMBS-LYCHE 1940, pp. 85–92: as *R. octopus*; west coast of Norway. BRUNELLI 1941, p. 55: Venice, Adriatic Sea. MAADEN 1942*a*, pp. 347 ff.: Holland. VERWEY 1942, p. 419: Holland. FOX & PANTIN 1944, p. 121: as *R. cuvieri*. KOLOSVARY 1945, p. 140: Adriatic Sea. SKRAMLIK 1945, pp. 296–336: experiments; Naples. RANSON 1945*b*, p. 320: *R. pulmo*; Mediterranean; as *R. octopus*: Atlantic coast of France. CUTCLIFF 1946, p. 171: as *R. octopus*; Exeter, England. LELOUP 1947, p. 42: as *R. octopus*; Belgium. JOHNSEN 1948, p. 221: Norway. ROSSI 1949, p. 28: Golfo di Rapallo, Italy. FRANC 1951, p. 28: as *R. octopus*; St Malo, English Channel. KÜNNE 1952, pp. 14, 32, 43: as *R. octopus*; S.E. North Sea. RUSTAD 1952, p. 5: as *R. octopus*; Bergen, Norway. CHRISTOMANOS 1954, pp. 875, 876, figs. 1, 2: chemical examination of pigment; Mediterranean. HUMMELINCK 1954, p. 166: as *R. octopus*; no longer occurs in the Zuider Zee, Holland. LUBET 1954, p. 214: Arcachon, Bay of Biscay. NEWELL 1954, p. 331: as *R. octopus*; Kent, England. SOUTHWARD 1954, p. 20: as *R. octopus*; Irish Sea. BOVET 1955, pp. 94–101, figs. 1, 2: Ortebello, Thyrrenian Sea, Mediterranean; physiology. HORRIDGE 1955*a*, pp. 636–41: physiology. BASSINDALE & BARRET 1957, p. 248: Dale Fort, Wales. VALKANOV 1957, p. 17: Black Sea. CARTHY 1958, p. 197: responses to stimuli. HORRIDGE 1959, pp. 78, 81, 89.

Genus ***Rhopilema*** Haeckel 1880

Rhizostomatidae with large scapulets and long manubrium; mouth-arms with numerous clubs or filaments and usually with a large terminal club; usually without a ring canal; canal network broad with numerous fine meshes; interrhopalar canals wide.

Type-species: *R. rhopalophorum* Haeckel.

HAECKEL 1880, p. 596: *Rhopilema* n.g. MAYER 1910, p. 704.

Rhopilema esculentum Kishinouye 1891

More than 450 mm wide and 330 mm high, when contracted; about 50 mm thick at centre, exumbrella smooth; in each octant 14–20 oval velar lappets with numerous radial grooves; the mouth-arms have no definite terminal clubs, but numerous filamentous and large fusiform appendages between the mouths.

Kishinouye 1891, p. 53: *Rhopilema esculenta* n.sp.; Japan. Mayer 1910, p. 704, text-fig. 423: ?=*R. rhopalophora* Haeckel; (Japan; China). Bigelow 1913, p. 101: Japan. Stiasny 1921*b*, p. 162: ?=*R. rhopalophora*. Uchida 1927*b*, p. 233, figs. 7–10: *R. esculenta* var. *asamushi* nov. var.; Japan. Wu 1927, p. 1: China. Tu 1931, p. 87: as *Rhopilema*; Bay of Korea. Stiasny 1933*b*, p. 154: comparison with *R. rhopalophora*. Uchida 1938*a*, p. 149: as *R. esculenta* and *R. asamushi* n.sp.; Japan. Uchida 1938*b*, p. 45: *R. asamushi* a valid species; Japan. Chiu 1954*b*, pp. 55, 56: China. Uchida 1954, pp. 209–19, fig. 2: as *R. esculenta* and *asamushi*; Japan. Naumov 1956*b*, p. 38. Uchida 1958, p. 165: as *R. asamushi*; Sado, Japan.

Rhopilema hispidum (Vanhöffen 1888)

250–340 mm wide, exumbrella with numerous small, sharp-pointed, conical projections; in each octant about eight velar lappets, oblong, rounded; mouth-arms terminate in a large club-shaped appendage with a faceted, swollen end, other club-shaped appendages between the mouths on the three wings.

Vanhöffen 1888, pp. 32, 43, Pl. 5, figs. 1, 2: as *Rhizostoma hispidum* n.sp.; Hong Kong, China. Maas 1903, p. 73, Pl. 9, figs. 78–81: *Rhopilema hispidum*; Malay Archipelago. Mayer 1910, p. 706: synonym: *R. verrucosa* Kishinouye; (Japan). Light 1914*b*, p. 227, figs. 14–16: as *R. visayana* n.sp.; Philippines. Stiasny 1920, p. 229: Malay Archipelago. Stiasny 1921*b*, p. 163, Pl. 2, fig. 15, Pl. 4, figs. 34–6, Pl. 5, fig. 48, text-fig. 15: Malay Archipelago; p. 167: *R. visayana* Light =*hispidum*. Rao 1931*a*, p. 62: Orissa coast, Bay of Bengal. Stiasny 1933*b*, p. 154: comparison with *R. rhopalophora*. Stiasny 1933*c*, pp. 162–74, figs. 1–8: Malay Archipelago. ?Menon 1936, p. 8: ?*R. hispidum* juv.; Krusadai Islands, Indian Ocean. Stiasny 1938, p. 31: Red Sea. Stiasny 1939*b*, p. 20, figs. 5–8: Red Sea. Ranson 1945*b*, p. 320: Suez Bay; Indochina. Nair 1951, p. 75: Trivandrum coast, India. Pannikar & Prasad 1952, pp. 295–296: association between ophiuroids, fish, crabs and *R. hispidum*. Uchida 1954, pp. 209–19, fig. 2, map: Japan.

Rhopilema rhopalophorum Haeckel 1880

42 mm wide (Haeckel: 100 mm wide, 50 mm high); exumbrella quite smooth, very thin; in each octant 14–16 (Haeckel: 18) roundish, flat velar lappets; without subgenital papillae; scapulets small; manubrium extraordinarily short, mouth-arms about 25 mm long, proximal portion 3 mm, distal portion 12 mm and terminal club 10–12 mm long; on mouth-arms a very few small clubs; filaments only on scapulets, faintly developed; ring canal poorly developed, intracircular canal system noticeably broad, its inner

margin parallel to the outline of the stomach, with many anastomoses with the rhopalar canals.

HAECKEL 1880, p. 596: *Rhopilema rhopalophora* n.sp.; east of Madagascar. MAYER 1910, p. 704: ? = *R. esculenta* Kishinouye. STIASNY 1933*b*, pp. 149–55, figs. 1–4: a valid species; Amoy, China.

Rhopilema verrilli (Fewkes 1887)

350 mm wide, thick and rigid; centre of exumbrella smooth, lappets with many shallow furrows, and near margin numerous minute elevations; in each octant six large oval velar lappets; mouth-arms with 26–60 blunt, spindle-shaped appendages besprinkled with nematocyst warts, each arm with a large, tapering terminal appendage.

FEWKES 1887, p. 119, Pl. 4: as *Nectopilema verrillii* n.g., n.sp.; New Haven, Connecticut, U.S.A. MAYER 1910, p. 707, Pl. 74, figs. 1, 1′, text-fig. 424: *Rhopilema verrillii*; Atlantic coast of U.S.A. BIGELOW 1914*b*, p. 29: Atlantic coast of U.S.A. STIASNY 1921*b*, p. 163. STIASNY 1933*b*, p. 154: comparison with *R. rhopalophora*. HEDGPETH 1954, p. 278: Gulf of Mexico.

Family *STOMOLOPHIDAE*

Scapulatae with mouth-arms coalesced throughout their entire length; with a permanent primary mouth opening; manubrium with reduced canal system; lower arms dichotomously or irregularly branched, without terminal clubs.

Genus ***Stomolophus*** L. Agassiz 1862

Usually without ring canal; rhopalar canals thickened; large scapulets; with a very wide, long and small-meshed canal system, lying very near to the radial canals.

Type-species: *S. meleagris* L. Agassiz.

L. AGASSIZ 1862, pp. 138, 151: *Stomolophus* n.g. HAECKEL 1880, pp. 597, 598: as *Brachiolophus* n.g. and *Stomolophus*. MAYER 1910, p. 709: *Stomolophus*.

Stomolophus fritillarius Haeckel 1880

Up to 90 mm wide, higher than a hemisphere, margin not constricted, usually incised in the middle of each octant; number of velar lappets variable, about 24 in each octant, grooves between them alternately long and short; scapulets short, hidden under the bell, their lower margin far removed from the bell margin; the lateral branches of the free ends of the mouth-arms short.

HAECKEL 1880, p. 598, Pl. 35, figs. 1–9: *Stomolophus fritillaria* n.sp.; Surinam, Atlantic coast of S. America. MAYER 1910, p. 711: as *S. meleagris* var. *fritillaria*.

BIGELOW 1914*c*, pp. 239–41: *S. fritillaria*=*meleagris.* STIASNY 1921*b*, p. 170: *S. fritillaria* a valid species. STIASNY 1922*b*, p. 55, fig. 4: non=*S. meleagris.* STIASNY 1931*a*, p. 169, figs. 7–9: British Guiana, S. America. RANSON 1945*b*, p. 320: French Guiana, S. America. RANSON 1949, pp. 150–4: discussion of species of *Stomolophus*; both *S. meleagris* and *fritillaria* are valid species; French Guiana. KRAMP 1955*b*, p. 165: *S. meleagris* var. *fritillaria*; discussion.

Stomolophus meleagris L. Agassiz 1862

Up to 180 mm wide, half-egg-shaped or almost globular; number of velar lappets variable, about 14 in each octant, grooves between them short, all alike; scapulets large, extending to or beyond level of bell margin; the free, bifurcate ends of the mouth-arms flare outwards, the lateral branches long.

L. AGASSIZ 1862, pp. 138, 151: *Stomolophus meleagris* n.g., n.sp.; east coast of U.S.A. HAECKEL 1880, p. 599: as *S. meleagris* and *agaricus* n.sp. VANHÖFFEN 1888, pp. 31, 42, Pl. 3, figs. 4, 5, Pl. 4, fig. 1: as *S. chunii* n.sp. MAYER 1910, p. 710, Pls. 75, 76: synonyms; southern part of the east coast of U.S.A.; (West Indies; northern part of S. America; Gulf of Mexico; off Pacific coast of Panama). VANHÖFFEN 1913*a*, p. 430: West Indies. BIGELOW 1914*c*, pp. 239–41: only species of *Stomolophus*; San Diego, California. STIASNY 1920, p. 229: Venezuela. STIASNY 1921*b*, p. 171, Pl. 2, fig. 16, Pl. 4, fig. 37, Pl. 5, figs. 49, 50: Venezuela. STIASNY 1922*d*, pp. 499–511, figs. 1–8: development. STIASNY 1922*e*, p. 550, figs. 13, 14: Panama; San Diego, California; p. 553: the type-specimen of *S. agaricus* Haeckel is a shrivelled *meleagris.* BIGELOW 1926, p. 365. GUTSELL 1928, pp. 358, 359: association between the spider crab *Libinia dubia* and *S. meleagris*; N. Carolina, U.S.A. STIASNY 1931*a*, pp. 170–5: comparison with *S. fritillaria.* BOONE 1933, p. 48, Pl. 10: Florida, U.S.A. BOONE 1938, p. 55: Galapagos Islands. BIGELOW 1940, p. 316: synonyms *S. fritillaria* and *chuni*; eastern tropical Pacific. COLBY 1943, p. 67: Gulf of Mexico. RANSON 1945*b*, p. 320: Gulf of California; off Ecuador. RANSON 1949, p. 150: comparison with *S. fritillaria.* CHIU 1954*b*, p. 56. HEDGPETH 1954, p. 278: Gulf of Mexico. UCHIDA 1954, pp. 209–19, fig. 2, map: as *S. nomurai* Kishinouye; Japan. VANNUCCI 1954, p. 126, Pl. 6, fig. 3: Brazil. KRAMP 1955*b*, p. 165: by Haeckel 1880 determined as *S. agaricus.* HARTMANN & EMERY 1956, p. 307: as *Stomopholis meleagris*; California. VANNUCCI 1957*a*, pp. 594–6: (Brazil).

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* The abbreviations are in accordance with the *World List of Abbreviations* (3rd Edition), with some minor alterations by the author, where, in his opinion, the titles of the periodicals were too much abbreviated.

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Note. For the last three years the list may not be complete.

ADDENDA

In April and May 1960 some letters passed between the author and Dr J. Picard (Marseilles), in which he expressed some opinions to which I wish to call attention.

Pages 63 and 70. *Cnidostoma fallax* Vanhöffen and *Podocoryne*(=*Archaeoceania*) *tournieri* Picard & Rahm. Dr Picard regards these two species as identical, belonging to the genus *Cnidostoma*, which he will refer to the family Clavidae.

Pages 83 and 86. *Chiarella centripetalis* Maas and *Koellikerina ornata* Kramp. Dr Picard is inclined to regard these as identical, in which I cannot agree with him, having examined one of Naumov's specimens of '*Rathkea jaschnowi*'.

Pages 113 and 130. *Pandeopsis scutigera* Kramp and *Tiaranna ikarii* Uchida. Dr Picard is undoubtedly right that these are identical and should be called *Pandeopsis ikarii* (Uchida).

Page 137. *Orchistomella.* Dr Picard may possibly be right that *O. graeffei* (Neppi & Stiasny) and *O. tentaculata* (Mayer) are young specimens of *Aequorea*, whereas he will retain the species *Orchistomella applanata* Kramp, which then becomes the type-species of the genus *Orchistomella.*

Pages 143 and 157. *Melicertissa adriatica* Neppi. Dr Picard refers this species to *Octogonade mediterranea* Zoja, of which he has found a specimen at Villefranche-sur-Mer.

Page 173. *Cirrholovenia tetranema* Kramp. Dr Picard tells me that he has found this species at Villefranche-sur-Mer and approves of my description. I have also been told that Dr Anita Brinckmann has found this species at Naples.

Page 26. *Sarsia brevia* Uchida. In a collection of medusae from Vietnam I have found some specimens of this species, and in a forthcoming paper it will be designated as the type-species of a new genus of Tubulariidae.

Page 52. *Pteroclava krempfi* (Billard). Billard, A., 1919. Note sur une espèce nouvelle d'hydroïde gymnoblastique (*Clava krempfi*), parasite d'un Alcyonaire. *Bull. Mus. d'hist. nat., Paris*, 1919, no. 3, pp. 187–8, fig. 1. *Clava krempfi* n. sp., hydroid; French Indochina. Weill, R., 1934*b*, p. 423, fig. 263: as *Pteroclava* (*Clava*) *krempfi*; description of newly liberated medusa; cnidome; French Indochina.

Page 106. *Merga tregoubovii* Picard. A description is given of this new species from the Mediterranean by Picard, J.: *Merga tregoubovii* nouvelle Anthoméduse *Pandeidae* du plancton de Villefranche-sur-Mer. *Rapp. Comm. int. Mer Médit.*, Vol. 15, pp. 333–36, 1960.

Page 167. *Phialidium gregarium* (Agassiz). I have recently examined a large collection from Puget Sound of the *Phialidium* which frequently occurs in Puget Sound in enormous quantities and generally has been called *P. gregarium.* The collection was sent to me by Dr E. C. Roosen-Runge, Seattle, who wanted to discuss the specific name. It seems probable, though not absolutely certain, that the medusa described under that name by Murbach & Shearer 1903, was identical with the species briefly described by Agassiz 1862, and I was able to state that it cannot be referred to any other known species of *Phialidium.* As it would be highly deplorable to add a new name to the long list of species of this genus, I propose to call the species *Phialidium gregarium* (Agassiz) with a note that this name is taken in the sense as defined by Murbach & Shearer.

Page 203. *Tima lucullana* (Delle Chiaje). Mr Kay W. Petersen, Copenhagen, has examined fresh specimens at Naples and stated that the number of statocysts is usually eight, in contradistinction to the great number of statocysts in the other species of *Tima*. In a forthcoming paper, therefore, he is going to erect a new genus for this species.

Page 213. *Moerisia*. A brackish-water hydroid, *Laccocoryne horii* n.g., n.sp. from Japan was described in UCHIDA, T. & UCHIDA, S., 1929, pp. 157–8, 3 text-figs. In a recent paper, UCHIDA, T. & NAGAO, Z., 1959, pp. 265–81, text-figs. 1–36, the medusa is described and the species referred to the genus *Ostroumovia*. In my opinion it belongs to *Moerisia*.

Page 223. *Gonionemus vertens* A. Agassiz. This summer (1960) I found a specimen among algae near Frederikshavn in northern Jutland, and some specimens collected at Ritthem in Holland were sent to me for identification. Thus Denmark and Holland may now be added to the European countries, where this medusa occurs.

Page 233. *Proboscidactyla*. Descriptions of the hydroid ('*Lar*') and medusae of *P. flavicirrata* Brandt, *P. occidentalis* (Fewkes) and a new species, *P. circumbella* from California, are given by C. HAND, 1954: Three Pacific species of '*Lar*' (including a new species). Their hosts, medusae, and relationships. *Pacif. Science*, Vol. 8, no. 1, pp. 51–57, text-figs. 1–7.

Page 255. *Colobonema apicatum* Russell. A description of this new deep water species found in the North Atlantic is given by RUSSELL, F. S.: A new deepwater Trachymedusa. *J. mar. biol. Ass. U.K.*, Vol. 41, pp. 1–3, 1961.

Page 290. *Tetraplatia*. In a recent paper (in *Proc. R. Soc.*, B, Vol. 152, 1960, pp. 236–81), DR PATRICIA RALPH refers *Tetraplatia* to the coronate Scyphomedusae.

Page 347. *Stygiomedusa fabulosa*. A detailed description of this species is given by RUSSELL, F. S. & REES, W. J.: The viviparous Scyphomedusa *Stygiomedusa fabulosa* Russell. *J. mar. biol. Ass. U.K.*, Vol. 39, pp. 303–17, 1960.

While the present paper was in press a most important work has been issued: NAUMOV, D. V., 1960. Hydroids and Hydromedusae of marine, brackish and freshwater basins of the U.S.S.R. Opred. po Faune S.S.S.R. Zool. Inst. Akad. Nauk. S.S.S.R. no. 70, 585 pp., Pl. I–XXX, 463 text-figs. (In Russian.)

INDEX

TO GENERA WITH SPECIES

Names of genera adopted in this work are in Roman type, as are those of species when associated with the correct genus; names used *only* as synonyms are in *Italic* type. Page numbers, when in Roman type, refer to names used in their correct sense, and lead straight either to the List of Genera on pp. 11–19, or to the actual account of the genus or species in the main text. When page numbers are in *Italic* type the associated name appears *only* as a synonym, or (occasionally) in some subsidiary context.

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